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ABSTRACT

The purpose of this report is to: (a) review certain major theories of work motivation, particularly as related to job satisfaction, (b) distill from such theories and other research, implications for an Air Force job satisfaction research program, and (c) provide a comprehensive bibliography of satisfaction/retention studies. The theoretical positions considered were two-factor, equity, instrumentality-expectancy, Cornell studies of satisfactions, and need-fulfillment. It was concluded as a result of the review that the military services have made some use of theories in job satisfaction/retention research (mostly two-factor and need-fulfillment), and use of other theoretical developments is increasing. Apparent needs consist of defining job satisfaction in the Air Force and studying variables that may produce satisfaction/dissatisfaction. A general model of satisfaction was devised to provide a conceptual framework for further systematic inquiry regarding the relationship of job satisfaction, performance, tenure, and other relevant variables (An 11-page bibliography is included.) (Author/AG)

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AIR FORCE HUMAN RESOURCES LABORATORY

REVIEW AND IMPLICATIONS OF JOB SATISFACTION AND WORK MOTIVATION THEORIES FOR AIR FORCE RESEARCH

By

Thomas C. Tuttle
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U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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The purpose of this report is to: (*a*) review certain major theories of work motivation, particularly as related to job satisfaction, (*b*) distill from such theories and other research, implications for an Air Force job satisfaction research program, and (*c*) provide a comprehensive bibliography of satisfaction/reten ion studies. The theoretical positions considered were Two-Factor, Equity, Instrumentality-Expectancy, Cornell Studies of Satisfactions, and Need-Fulfillment. Certain implications and conclusions relevant to Air Force job satisfaction/retention research were derived, a general model of satisfaction/tenure for further inquiry was developed, and various recommendations regarding a long-range systematic research program were offered.

SUMMARY

In order to meet the challenge of providing satisfying work opportunities in an all volunteer force, the Air Force has undertaken the development of a comprehensive job satisfaction/work motivation research program. The successful development of such a program should take advantage of previous research and conceptualization of relevant problems by others.

The purpose of this report is three-fold. First, the report reviews various theories of work motivation, in particular as they relate to job satisfaction. Second, the paper distills from these theories and other research relating to the theories, implications and recommendations to help guide Air Force work satisfaction and retention studies. This effort attempted to determine what theoretical position was preferable and was oriented toward the development of a useful conceptual framework for Air Force job satisfaction/retention research. Finally, the attempt to review major theories necessarily entailed an extensive literature search which yielded studies beyond the range of the prescribed objectives of this report. To provide the reader with a wider perspective of job satisfaction research, a bibliography of studies primarily from civilian resources is incorporated as an appendix.

The five major positions considered were: (*a*) two-factor theory, (*b*) equity theory, (*c*) instrumentality – expectancy theory, (*d*) Cornell studies in satisfaction, and (*e*) need-fulfillment theory. For each of these approaches the basic concepts were described, major modifications, if any, were discussed, and a brief assessment of strengths and weaknesses presented.

From the review and implications certain conclusions were drawn which appear relevant to Air Force job satisfaction/retention research. These are as follows:

1. The military services have made some use of theories in job satisfaction/retention research. Two-factor and need-fulfillment theories have been used most frequently, but there are indications of increasing use of more recent theoretical developments. An eclectic theoretical orientation for Air Force research appears desirable at present.

2. An important first step for a long-range program is the definition of job satisfaction in the Air Force. Such an effort should determine the relevant dimensions of job satisfaction from the point of view of Air Force personnel.

3. Certain sets of variables that may produce satisfaction/dissatisfaction were considered. The variables which appear to warrant further systematic investigation were categorized as individual, situational, individual-situational, and output variables. A suggested sequence for studying these variables and certain measurement problems were examined.

4. A general model of satisfaction was devised to serve as guidance for the Air Force long-range research program. The purpose of the model was to provide a conceptual framework for further systematic inquiry regarding the relationship of job satisfaction, performance, tenure, and other relevant variables.

Based on these conclusions, the following recommendations were drawn concerning Air Force job satisfaction-retention research.

1. Since measurement techniques may affect results obtained, the use of varied methods (e.g., survey, interviews or combinations) for assessment of job satisfaction seems preferable.

2. Development of a detailed occupational attitude inventory for inferring the dimensions of job satisfaction for Air Force personnel should be given priority.

3. Relationships between the dimensions of job satisfaction and tenure for Air Force personnel should be investigated. This suggestion implicitly recognizes that tenure is the criterion by which the success of a job satisfaction program will be evaluated.

4. Interest requirement estimates and potential reinforcers should be determined for career ladders with turnover problems through the use of occupational analysis procedures. Such procedures may also be used to improve ability versus ability requirement matches of personnel to increase performance as well as satisfaction.

5. The measurement of satisfaction variables along with the administration of occupational inventories at two different time periods should be undertaken in order to determine the effect of job changes on satisfaction and tenure.

6. As additional research yields further insight concerning specific changes in job structures that are amenable to alteration within the operational personnel system, offer recommendations as appropriate regarding job enrichment/enlargement for Air Force personnel. Ultimately, the development of job enrichment guidelines for commanders and supervisors may be feasible. However, the development of overall guidelines should be approached cautiously due to the possibility that the effects of application of job enrichment procedures may vary widely for different occupational career fields and different Air Force sub-populations.

7. Reconsider the investigation of the job satisfaction-performance relationship if methodological breakthroughs in occupational analysis research indicate that development of individual performance criteria at a more specific (e.g., task) level is feasible.

8. Consideration of new theoretical developments seems desirable for a systematic Air Force job satisfaction research program. In addition to the guidance function for research served by theories, such an approach may increase the probability of generating operationally useful recommendations based on consistent substantive evidence.

PREFACE

This research was completed under Project 7734, Development of Methods for Describing, Evaluating, and Structuring Air Force Occupations, Work Unit 77340501, Impact of Work-Related Factors on Job Satisfaction and Career Decisions.

As the services move further into an all volunteer force situation the procurement and retention of trained personnel becomes more important. Since there is substantial evidence that job satisfaction is related to turnover rates, job satisfaction research has been assigned high priority by Air Force Management. Additionally, in late 1971 the Air Force Human Resources Laboratory's Occupational Research Division initiated a long-range systematic job satisfaction research program. As the program evolved, the desirability of examining and evaluating previous evidence became more apparent. However, with approximately 40 years of research to consider, a typical literature review presented certain practical constraints, especially with regard to reconciling controversies and reduction of such a mass of information to manageable proportions. Further, a number of such reviews have already been accomplished. Consequently, some approach other than the usual literature review seemed advisable.

Assuming that work motivation theories represented a synthesized summarization and critical evaluation of the state-of-the-art in job satisfaction research, the strategy selected consisted essentially of a review of certain major job satisfaction theories. Thus, this report is concerned with the logical derivation of major implications and recommendations for the Air Force Human Resources Laboratory's job satisfaction/retention research program and derived from extant work motivation/satisfaction theories. Additionally, this initial effort attempts to outline objectives and establish a conceptual framework for future research.

Since job satisfaction/work motivation is such a dynamic research area, in early 1973 the effort to obtain copies and review studies or reports was reduced. Consequently, some more recent research may not be included in the present report.

Appreciation is expressed to Dr. Raymond E. Christal for his penetrating discussions concerning interpretation of findings and to Mrs. Joann Archer and Ms. Donna J. Wiechecki for their assistance in preparation of the references and consolidated bibliography.

The views expressed are those of the authors and do not necessarily reflect an official indorsement of all aspects of the report by the United States Air Force or Department of Defense.

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REVIEW AND IMPLICATIONS OF JOB SATISFACTION AND WORK MOTIVATION THEORIES FOR AIR FORCE RESEARCH

I. INTRODUCTION

Air Force Personnel System in an All Volunteer Force Environment

As the military services moved into a zero-draft environment, the potential impact of this change on military personnel systems was studied extensively (President's Commission Report, 1970). Consequently, during recent years efforts have been made to increase the attractiveness of the Air Force as a viable career alternative. For example, pay has been raised, irritants have been removed, Air Force technical training has become recognized by civilian accrediting agencies, and considerable emphasis has been placed on "people oriented" programs such as human relations training. Other changes to improve job satisfaction of Air Force personnel may reasonably be contemplated.

During this transitional period the Air Force has been able to fill its enlistment quotas, although it has encountered some deterioration in the number and quality of applicants for enlistment. Some attribute the maintenance of adequate enlistment levels to the added incentives which have been offered. Others, more skeptical, attribute the continued success in accession at least in part to the depressed civilian economy and its rather high rate of unemployment. Regardless of the views accepted, there appear to be few strong positive assurances that with the absence of the draft as a motivator, Air Force enlistments in high aptitude occupational areas will continue at an acceptable rate in a healthy civilian economy.

During such economic periods the Air Force will probably find itself in a competitive situation with industry and the other military services with respect to recruitment and retention of an adequate number of high quality personnel. To be in a favorable competitive situation, the Air Force must meet the economic and non-economic needs of members of the labor force. There are numerous reports in the popular news media which strongly suggest that individuals, particularly younger persons, are demanding more out of their jobs in terms of autonomy, challenge, and opportunities for growth and fulfillment. In order to satisfy these non-economic needs, it will be necessary for the Air Force to devote considerable effort towards accomplishing research concerning possible job and policy changes which will lead to more satisfying jobs. Certain of these views were expressed in October 1972, by the Secretary of the Air Force.

> Military people have received several well-earned pay raises in the last 8 years. However, we firmly believe that monetary incentives in themselves will not achieve our goals – the ultimate key is job satisfaction. We know we must provide opportunity and challenge for our young people. Each member needs to feel that he is afforded the chance to contribute to the best of his ability. In this regard, we are conducting extensive studies in various specialties to insure that training and jobs are properly matched with the right individual [Air Force Policy Letter for Commanders, 1972].

Satisfaction and Retention Relationship

Job satisfaction has been a popular subject of research in industrial psychology since the appearance of Hoppock's (1935) book on the topic almost four decades ago. One of the few consistent findings during this period of research has been the relationship between satisfaction on the job and the decision to remain in or depart from the work situation. Brayfield and Crockett (1955) in a landmark review of satisfaction research, concluded that there is some evidence to support a positive relationship between employee attitudes and employment stability. Vroom (1964) concludes that the evidence points to a consistent negative relationship between satisfaction and the probability of resignation. He also cited studies which indicated that turnover is highest during periods of low unemployment.

In a review of eight studies which investigated the satisfaction-tenure relationship, Schuh (1967) found positive relationships between satisfaction and tenure. A more recent review (Porter & Steers, 1972) shows that the results of 13 out of 14 studies revealed a significant negative relationship between satisfaction and turnover. Porter and Steers (1972) concluded that the data support a model which argues that turnover is a function of the extent to which the work situation meets the expectations of workers in terms of rewards.

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Although the satisfaction-tenure relationship has received consistent support, the strength of the reported relationships have varied considerably from situation to situation. The reported correlations in the Schuh (1967) review ranged from .20 to .42. Commenting on similar sized correlations, Vroom (1964) points out that the typical study omits an important variable or set of variables. Since the individual who leaves an organization is usually moving to some other organization, the analysis should take this into account. Thus, satisfaction with the old organization as well as anticipated satisfaction with the new organization affect the decision.

Nevertheless, the research evidence points to the existence of a consistent relationship between satisfaction and tenure in organizations. It is possible that stronger relationships can be demonstrated between satisfaction and tenure if the attractiveness of alternatives is considered as well as the attractiveness of one's present situation.

Justification for Job Satisfaction Research in the Air Force

Based on the foregoing statements there appear to be two closely related reasons for the Air Force to be concerned with the job satisfaction of its personnel. First, in a time when individuals are demanding more of a job than economic return, the Air Force should provide more satisfying work in order to be able to compete in the labor market. Second, if the Air Force expects to retain those personnel who enlist, individuals should be afforded the opportunity to make use of their talents and training, and perceive the Air Force as an environment conducive to personal growth and development.

From the more pragmatic view of Air Force functional managers, the following statement may summarize, rather concisely, reasons for the study of job satisfaction. "The Air Force does not have so much a need for men that are satisfied with their jobs as it does for men who will not be dissatisfied to the point where performance effectiveness and retention rates decrease [System Development Corporation, 1972, p. 144]."

The matter of performance effectiveness and productivity may offer still another reason for Air Force concern regarding job satisfaction. Although there is substantial agreement regarding the satisfaction-retention relationship, considerable controversy exists regarding the strength of any performance-satisfaction relationship (Kuhn, Slocum, & Chase, 1971; Lawler, 1968a). An earlier review (Brayfield & Crockett, 1955) indicated a limited relationship between satisfaction and performance, whereas Herzberg, Mausner, and Snyderman (1959) concluded there was frequent evidence that positive job attitudes are favorable to increased productivity. Conversely, Lawler and Porter (1967b) opposed the common assumption that employee satisfaction affects performance. Perhaps a reasonable assessment of the current status of this controversy from job enrichment research is that at least the two variables go together in some manner. Regardless of the view taken, better understanding of the nature of the existence of such a relationship should provide additional justification for the study of job satisfaction.

Purpose of Report

In order to meet the challenge of providing satisfying work opportunities, the Air Force has undertaken the development of a comprehensive research program to provide sound recommendations for operational changes. Such a research program should take advantage of previous research and conceptualization of the problem by others in the field. Historically, the successful development of the Air Force occupational analysis and job evaluation programs support the usefulness of such an approach. For example, the bibliographic reports by Morsh (1962) on job analysis and Madden (1961) on job evaluation were particularly helpful in the early development and subsequent guidance of research in these programs.

The purpose of this report is three-fold. First, the report reviews various theories of work motivation, in particular as they relate to job satisfaction. Second, the paper attempts to distill from these theories and other research relating to the theories, implications for an approach which will be useful for Air Force work satisfaction and retention studies. Hopefully this effort can provide input to development of a useful conceptual framework for the Air Force job satisfaction/retention research program. As part of the second objective, an effort is made to determine if any existing theory is sufficient to serve as a basis for an Air

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Force research program or if a multi-theoretical approach would be preferable. An effort is also made to examine the extent to which military research has involved any major job satisfaction theories.

Finally, the report attempts to provide the reader with a reasonably comprehensive bibliography of job satisfaction research. With approximately four decades of such research to consider, practical considerations dictated certain limitations in the scope of the present report. As a matter of efficiency and to provide a wider perspective of job satisfaction research, a listing of studies primarily from civilian sources is incorporated as an appendix. The essential distinction between military versus civilian references was either the source of publication or the use of military rather than civilian samples. This distinction is explained more completely in the bibliography preface.

The supplemental bibliography (Appendix A) includes a preface and synopsis of certain general findings regarding job satisfaction research outside the main purpose of the report (i.e., review of job satisfaction theories with implications for Air Force research). Assuming the theories considered represent a large percentage of the more important past and present research findings, such a restriction in scope should still permit presentation of many major implications desirable to consider in an Air Force research program. Additionally, due to the large number of both civilian and military studies, the bibliography restriction to civilian source references seemed more feasible and appropriate for present purposes. However, a review of studies dealing primarily with military populations may be particularly useful for Air Force research implications and appears to warrant further consideration. Due to certain fundamental differences between the "world of work environments" for military and civilian population (e.g., frequency of reassignments, work hazards, dress and appearance), a literature search concentrating on the military may reveal some facets of job satisfaction not detectable entirely from the civilian sector research.

II. REVIEW OF WORK MOTIVATION/SATISFACTION THEORIES

This section presents reviews of five major approaches to the study of work motivation/satisfaction. The approaches to be discussed are: (a) Two-Factor Theory, (b) Equity Theory, (c) Instrumentality-Expectancy Theories, (d) Cornell Studies in Satisfaction, and (e) Need-Fulfillment Theories. Although there are other theories of work motivation such as Korman's (1970) "balance" theory and Locke's (1968, 1969) goal oriented theory, the theories selected for discussion were believed to be the major theories in terms of the amount of research devoted to them and in terms of potential implications for the Air Force program of job satisfaction research.

The discussion of each of the five major approaches has three objectives. First, the discussion attempts to clearly describe the basic concepts of each approach. Second, major modifications of the basic approach, if any, are discussed. Finally, a brief assessment of the relative strengths and weaknesses of each approach is presented.

Two-Factor Theory

Basic Concepts and Modifications. The approach which has probably generated the most research and certainly the most controversy is Herzberg's two-factor theory (Herzberg et al., 1959; Herzberg, 1966). Herzberg's (1959, 1966) work broke with some of the traditional experimental approaches to job satisfaction. His data collection techniques emphasized structured, in-depth interviews of job incumbents, and attempted to determine what job incidents or events were associated in the past with high satisfaction and what incidents or events were associated with high dissatisfaction. These responses were subjected to content analyses and various factors or commonalities in the sequences were identified. Based on such analyses, Herzberg and his associates (1959) came to the conclusion that certain types of incidents were frequently associated with feelings of satisfaction on the part of the workers, and certain qualitatively different types of factors were regularly associated with dissatisfaction. The "satisfiers," or "motivaters" as they came to be called, included job-content factors such as Achievement, Recognition, Advancement, Responsibility, and Work Itself. The "dissatisfiers" or "hygienes" were context-type factors such as Company Policies and Practices, Interpersonal Relations with Co-Workers, Interpersonal Relations with

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Supervisors, Technical Aspects of Supervision, Salary, and Working Conditions. Herzberg et al., (1959) postulated that satisfaction is a function of both the "satisfiers" and the "dissatisfiers." If the positive aspects of both the "satisfiers" and "dissatisfiers" are present at sufficient levels, then satisfaction will be high. However, if the satisfiers are removed, indifference but not dissatisfication will result. Dissatisfaction will occur only when the negative aspects of the dissatisfiers are present. Thus, the positive aspects of these dissatisfiers constitute necessary but not sufficient conditions for satisfaction. Job satisfaction is seen as being a two-dimensional construct; hence, the label, "two-factor theory."

The original study from which the theory was "induced" was based on interviews with approximately 203 engineers and accountants in the Pittsburgh area. Subsequent research reported by Herzberg (1966) tested the theory with 15 groups of employees, including both males and females, hourly and salaried groups, United States and foreign workers. Herzberg (1966) claims that predictions from the theory were supported by the data from these groups (total N = 1017) in 97 percent of the cases. In all of these studies the original Herzberg (1959) methodology, or a slight variation of it, was employed.

A number of writers have cited evidence interpreted as critical of the two-factor theory (Ewen, 1964; Ewen, Smith, Hulin, & Locke, 1966; Friedlander, 1963; Graen, 1966, 1968; Hulin & Smith, 1967). Other writers have criticized the research supporting the theory on methodological grounds (Burke, 1966; Dunnette, 1965; House & Wigdor, 1967; Lindsay, Marks, & Gorlow, 1967; Malinovsky & Barry, 1965; Vroom, 1964). The critics were the subject of some counter attacks (Herzberg, 1966; Whitsett & Winslow, 1967; Winslow & Whitsett, 1968). Even though this often heated controversy has raged for over 10 years, the basic question of the status of the two-factor theory has not been settled. The following assessment by Dunnette, Campbell & Hakel (1967), repeated by House & Wigdor (1967), seems appropriate: "the Two-Factor theory is an oversimplification of the relationships between motivation and satisfaction, and the sources of job satisfaction and dissatisfaction [p. 387]."

Although this observation seems appropriate in light of the conflicting evidence, it could also be said about any other theory of work motivation currently in existence. Perhaps the Herzberg (1966) theory is more of an oversimplification than other theories. However, a more basic flaw seems to be the ambiguity with which its proponents have stated it. Much of the controversy seems to be the result of differing views of what is "The" two-factor theory (King, 1970; Lindsay et al., 1967).

Lindsay et al., (1967) state: "It seems apparent that part of the ambiguity surrounding the Herzberg theory might be attributable to methodological inconsistences and the lack of a formal and logically consistent statement of the relations among the variables of interest [p. 330]."

In a recent article, King (1970) attempted to reduce the ambiguity surrounding the two-factor theory by formally stating five versions of the theory that "have been stated or implied by various researchers [p. 19]." These five versions represent varying degrees of strength. The five versions defined by King (1970) are summarized below.

I. All motivators (Ms) combined contribute more to job satisfaction (S) than to job dissatisfaction (D), and all hygienes (Hs) combined contribute more to D than to S.

II. All Ms combined contribute more to S than do all Hs combined, and all Hs combined contribute more to D than do all Ms combined.

III. Each M contributes more to S than to D, and each H contributes more to D than to S.

IV. Theory III holds, and in addition, each principal M contributes more to S than does any H, and each principal H contributes more to D than does any M.

V. Only Ms determine S, and only Hs determine D.
[Table 2, p. 19].

In discussing the different versions, King (1970) points out that it is not clear which version of the theory is the "basic" theory according to Herzberg (1966). In various writings, Herzberg (1966) seems to imply at times that version II is "the" theory, and at other times that versions III or V represent the theory.

On the other hand, some critics of the theory do not share a common view of which is the "real" theory. Thus, their attacks are directed toward different versions. For example, "House and Wigdor (1967) apparently acknowledged that replications of the original experiment supported Theory III; however, in a secondary analysis of this data they criticized the two-factor theory for failing to meet the requirements of

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Theory IV [King, 1970, p. 22]." Lindsay et al., (1967) on the other hand apparently determined that version V represented "the" two-factor theory.

After reviewing those studies which were determined relevant to one of the versions of the study, King (1970) drew the following conclusions.

"It is concluded that (*a*) two of these versions are invalid, as they are not supported by any empirical studies, [versions IV and V]; (*b*) another version is invalid, as its alleged empirical support merely reflects experimenter coding biases [version III]; and (*c*) the validities of the remaining two versions are, at present, indeterminate, as they have not been adequately tested in studies where defensive biases inherent in certain self-report measures are eliminated [versions I and II] [p. 18]."

King's (1970) analysis of the two-factor controversy seems to shed considerable light on the problems inherent in the theory which have produced the plethora of conflicting results. Until the proponents clarify their statements of the basic postulates of two-factor theory, it seems likely that the controversy will continue. If the theory is clarified and stated in a testable form, the controversy should begin to produce more light and less heat.

Assessment of Two-Factor Theory. The emphasis of the Herzberg (1966) theory is on situational variables. The motivators and hygienes are situational characteristics. The theory does not allow for differences in individual responses to situational characteristics. In fact, Herzberg (1966, pp. 100-101) cites evidence to support his contention that the results (i.e., frequency of incumbent's reports of motivators and hygiene factors) are stable across various subgroups formed on the basis of age, job classification, education, or personality characteristics.

This conclusion seems to run counter to a considerable amount of evidence in the field of industrial psychology. Evidence from the research of the Work Adjustment Project at the University of Minnesota seems to have established that individuals differ in terms of their preferences for various reinforcers in jobs (Weiss, 1969). Tuttle and Cunningham (1972) demonstrated differences in average interest and need scores of incumbents across occupational clusters. It hardly seems necessary to document the statement that individuals and occupational groups differ in terms of aptitudes, interests, and needs.

The fact that the Herzberg (1966) theory fails to recognize such differences in attempting to account for work motivation seems to be a serious weakness of the theory. Admittedly, life would be much simpler (although rather dull) if all individuals desired the same rewards from a job. The rather simplistic assumption that the way to make people happier and produce more is to fill their job with more motivators, can lead to some unfortunate consequences. It implies that job enrichment (i.e., increasing motivators) is a panacea. It may be true that, on the average, professional workers are "motivated" more by factors inherent in the job itself than by extrinsic factors. It may even be true for the majority of nonprofessional workers. However, before a manager jumps to the conclusion that it is "true" for his employees, it would seem prudent to verify the assumption in his situation.

In his latest book, Herzberg (1966), acknowledges the fact that individuals differ in terms of their preferences. He mentions that individuals can be characterized as "motivator seeking," "hygiene seeking," "motivator fulfilled," etc. However, no mechanism is built into the theory to take into account individual differences in reactions to work characteristics. Thus, it seems that the two-factor theory lacks comprehensiveness, in addition to its lack of explicitness.

Equity Theory

Basic Concepts and Modifications. Equity theory grew out of early work with the concepts of relative deprivation (Merton & Kitt, 1950; Stouffer, Suchman, DeVinney, Star, & Williams, 1949) and distributive justice (Homans, 1950, 1953, 1961; Zaleznik, Christensen, & Roethlisberger, 1958). The basic assumption of equity theory is that individuals have an expectation of a "fair" or "equitable" rewards level which they should receive from a social exchange. To the extent that this equitable level is not met by the actual rewards, feelings of inequity are generated. It is further assumed that feelings of inequity are unpleasant and that the individual adopts various strategies to reduce this perceived inequity.

According to Vroom (1964), several statements of the theory were made independently (Adams, 1963; Homans, 1961; Patchen, 1961). Since, again according to Vroom (1964), the different statements do not appear to have any testable differences, the statement of the theory by Adams (1965) will be discussed.

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Nature of Inputs and Outcomes. Basic to the theory are the concepts of Input and Outcome. Inputs are those attributes which are brought to the exchange and which are perceived as relevant for the exchange. An attribute is relevant if the person expects to receive a return. An outcome is an individual's receipt from the exchange. Outcomes may be positive; i.e., pay, status, good parking place, paneled office, or negative; i.e., monotony, poor working conditions, injury, insecurity. An attribute, or a return, functions as an Input or Outcome only if it is perceived as an Input or Outcome by the person. In addition, an outcome must be perceived as an outcome and it must have some marginal utility to function as an outcome.

Social Comparison Process. Inherent in equity theory is the notion of social comparison. The social comparison process involves a comparison between the inputs and outcomes of oneself (Person) and the inputs and outcomes of another person (Other). The reference, Person or Other, is presumed to be chosen by Person and will be someone comparable to Person on one or more attributes. Frequently this reference Person will be a co-worker. In the social comparison, Person develops expectations concerning what is a fair input-outcome ratio based on his own background and a consideration of the perceived input-outcome ratio of the reference Person.

Definition of Inequity. In any situation there are multiple Inputs (I_i) and Outcomes (O_i). Let Ip represent the sum of the inputs for person *p* (ΣIi), and Op represent the sum of the Outcomes for person *p* (ΣO_i). Correspondingly, let Ia and Oa represent the sum of the Inputs and Outcomes, respectively, for the reference Person, Other.

Given this notation, inequity can be defined in general terms as: $Op/Ip \neq Oa/Ia$. In other words, when the perceived ratio of Outcomes to Inputs for Person is not equal to the perceived ratio for a reference Person – Other – a condition of inequity exists. There are two types of inequity. When $Op/Ip > Oa/Ia$, a condition of overpayment inequity is said to exist. When $Op/Ip < Oa/Ia$, a condition of underpayment inequity is said to exist.

Methods of Reducing Inequity. As mentioned above, the theory assumes that inequity is an unpleasant condition, and that Person will attempt to reduce the feeling of inequity. Adams (1965) mentions six methods which might be employed by Person to reduce inequity. These will be described briefly.

1. *Person alters his inputs.* Person may affect the perceived ratio by either raising or lowering his inputs. Although some inputs such as age, sex, and race cannot be altered, others, such as the amount of effort expended, can be altered.

2. *Person alters his outcomes.* Some outcomes are subject to Person's control or influence. One direct approach to increasing outcomes is to simply ask for a raise. More indirect methods include complaining to a union representative, seeking more interesting work activities, etc.

3. *Person cognitively distorts input and outcomes.* This mechanism is quite similar to the psychoanalyst's concept of rationalization. It may involve a cognitive distortion of the value, importance, or relevance of inputs or outcomes in order to lower or raise their worth.

4. *Person may leave the field.* This represents a direct approach to reduction of inequity. Person may quit the job, or request a transfer.

5. *Person may act on Other.* This strategy involves Person acting directly or indirectly on Other to either raise or lower his Inputs or Outcomes. In an extreme form, Person might sabotage Other's work which would have the effect of lowering Other's inputs. Another approach might attempt to get a "rate buster" to voluntarily lower his Inputs.

6. *Person may change his object of comparison.* This only applies when Person and Other are in an exchange relationship with a third party, such as an employer. This would require Person to determine some dimensions of non-comparability between himself and Other.

Adams (1965) sets forth six propositions which attempt to account for the particular mode of inequity reduction which will be adopted by Person.

(*a*) Person will maximize positively valent outcomes and the valence of outcomes.

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(*b*) He will minimize increasing inputs that are effortful and costly to change.

(*c*) He will resist real and cognitive changes in inputs that are central to his self-concept and to his self-esteem. To the extent that any of Person's outcomes are related to his self-concept and to his self-esteem, this proposition is extended to cover his outcomes.

(*d*) He will be more resistant to changing cognitions about his own outcomes and inputs than to changing his cognitions about Other's outcomes and inputs.

(*e*) Leaving the field will be resorted to only when the magnitude of inequity experienced is high and other means of reducing it are unavailable. Partial withdrawal, such as absenteeism, will occur more frequently and under conditions of lower inequity.

(*f*) Person will be highly resistant to changing the object of his comparisons, Other, once it has stabilized over time and, in effect, has become an anchor [pp. 295-296].

Adams (1965) admits that although these propositions are very crude, they provide some basis for predicting the form inequity resolution will take. No basis is given for determining which of the propositions is likely to be dominant.

Extension of Equity Theory. Pritchard (1969) presents a review of some research dealing with equity theory predictions and concludes: "The research supports equity predictions in the area of underpayment, but the overpayment effects have not been satisfactorily demonstrated [p. 176]." He proceeds to suggest an elaboration of the theory as proposed by Adams (1965) in three areas: (*a*) the determinants of inequity, (*b*) dissatisfaction resulting from inequity, and (*c*) responses to dissatisfaction.

Determinants of Inequity. Pritchard (1969) elaborates on the nature of the social comparison process by stating explicitly that Person can serve his own Other. In other words, Person can use himself as the reference Person as well as someone else. Based on one's past history and knowledge of market values, he has developed internal standards which allow him to determine the fairness of his outcome/input ratio. Pritchard (1969) hypothesizes that feelings of inequity arise first and foremost from the correspondence between Person's own inputs and outcomes. If his inputs exceed outcomes he will experience feelings of inequity apart from the outcome/input ratio of anyone else.

Pritchard (1969) accepts Adams' (1965) proposition regarding the Person's attempt to maximize positively valent outcomes. By Adams' (1965) formulation, this maximization process is bounded by the equity situation; i.e., Person will maximize outcomes until he reaches or approaches a state of inequity compared to the reference person.

Pritchard (1969) adds to this process the concept of psychological distance between participants in the exchange relationship. This concept assumes that exchange relationships can be ordered on a continuum ranging from very intimate relationships, which are characterized by a high amount of psychological contact to highly distant relationships which have a minimum amount of psychological contact. Given this notion, it is possible to make differential predictions concerning the response to overpayment inequity as a function of the nature of the exchange relationship. Overpayment inequity is expected to be greater as the relationship becomes less distant. That is to say, an individual overpaid by his employer (an impersonal relationship) would experience less inequity than a person selling his house at a price considerably above the market value to his close friend.

Dissatisfaction Resulting from Inequity. According to Adams (1965), one of the behavioral consequences of inequity is expressed dissatisfaction. As mentioned earlier, inequity can either be from underpayment or overpayment. If an individual's inputs exceed his outcomes (underpayment), he will experience inequity and, therefore, dissatisfaction. In this case, the dissatisfaction will be directed toward the person, group, organization, or system which is perceived as controlling his outcomes.

In the case of overpayment, Pritchard's (1969) notion of psychological distance alters the predictions. If a person is over-rewarded in a direct exchange relationship, he will experience inequity and, therefore, dissatisfaction with the controller of rewards, himself. If, on the other hand, he is overpaid by his employer, he will feel that this is the fault of the system. Since Person is not the controller of rewards, it does not produce feelings of inequity, although he may feel sorry that his co-workers weren't as lucky as he. In this case, Person was over rewarded but did not experience inequity, and therefore would not express dissatisfaction.

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Summary of Pritchard's (1969) Extensions. Pritchard's (1969) primary contribution to equity theory as stated by Adams (1965) is an elaboration of the conditions under which Person will experience overpayment inequity. This extension of the theory should help account for some of the difficulty researchers have encountered in attempting to produce overpayment inequity effects.

His other contribution represents mainly a different emphasis from Adams (1965) rather than a modification. Pritchard (1969) allows oneself to be an Other for the comparison process. This can be used to account for inequity in the absence of a comparison person. At the same time, it raises the new issue of the means used by Person to combine the Person-self inequity with the Person – "Real Other" inequity to arrive at some "total" amount of inequity. If a combination is not made, what are the trade-offs between the two sources of inequity? Pritchard (1969) gives some hints in this regard but the basic question remains. Thus, while this extension offers some clarity, it raises new questions.

Assessment of Equity Theory. It seems proper to characterize Equity Theory as an interactionist theory. Individuals differ in terms of the relevant Inputs they bring to the work situation. Situations differ in terms of the Outcomes they provide. The social aspects of the situation are represented by the concept of the reference person or group. Therefore, it seems that all the ingredients necessary to consider the theory interactionist are present.

There are some distinguishing features, however. One distinguishing feature is the point of view, or frame of reference taken. The theory is very individualistic. The orientation is always through the eyes of the actor. Inputs and Outcomes which are perceived to be functioning by the actor may or may not correspond to the Inputs and Outcomes perceived to be functioning by other parties to the exchange relationship. Thus, concepts such as the "objective" level of Outcomes or "objective" level of Inputs are irrelevant unless their perceived level corresponds to that objective standard.

The most distinguishing feature of equity theory is the nature of the correspondence function. This function is a ratio of Outcomes to Inputs. To the extent that this value is less than 1, inequity, dissatisfaction, and action to restore the value to 1 are produced. To the extent that the value is greater than 1, the consequences are not clear. According to Pritchard (1969), a value greater than 1, in a direct exchange relationship, would produce the same results as a value less than 1. However, in an exchange with a third party, a value greater than 1 would produce satisfaction and no feelings of inequity. Depending on the specific version of the theory accepted, equity theory postulates a single function for relating Inputs to Outcomes and makes specific predictions.

In most applications of the theory, the range of Inputs has been rather vague. Some experiments are conducted as if the amount of effort expended were the only relevant input (Pritchard, Dunnette, & Jorgenson, 1972). Another investigation considered factors as specific as place of birth (Adams, 1965). Thus, there are few guidelines for defining, much less measuring, the relevant inputs in any particular situation.

The situation is somewhat better on the Outcomes side. Although equity studies have taken a very narrow approach to the range of relevant Outcomes (money has been the primary concern), there is considerable research from other approaches suggesting a number of other relevant dimensions of Outcomes. Furthermore, there is some agreement as to what dimensions are relevant and some measures exist (Smith, Kendall, & Hulin, 1969; Weiss, Dawis, England, & Lofquist, 1967). The theory itself places no limitations on the Outcome dimensions that are considered relevant. Thus, it would seem that researchers testing the theory should investigate its relevance in dealing with a wider range of Outcomes than has normally been the case.

Instrumentality – Expectancy Theories

Basic Concepts and Modifications. Perhaps the most prominent theory among active researchers in the field can be labeled instrumentality or expectancy theory. The ideas which are incorporated into the theory are not new since they borrow from writings of Lewin (1938), Rotter (1955), Atkinson (1958), and Tolman (1959). The first attempt at an expectancy[1] theory of work motivation was the path-goal model of Georgopolous, Mahoney, and Jones (1957).

[1] In this review the term expectancy will be used as a synonym for instrumentality – expectancy.

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The first formal statement of an expectancy theory of work motivation was made by Vroom (1964). Vroom's (1964) work was a significant milestone in the development of a theory of work motivation. He stated a theoretical position and then reviewed a large body of research dealing with various aspects of the motivation literature in terms of his framework. This effort highlighted many of the deficiencies of past research and pointed out vividly some research needs in the field. His work represents a tremendous step toward some order in a field which has known only disarray.

Following Vroom's (1964) statement of the theory there occurred something of a branching into two separate versions of the theory. This might be diagrammed as in Figure 1.

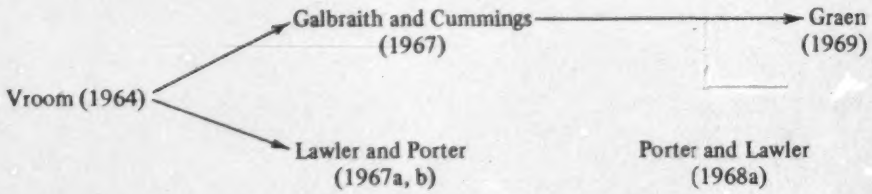

Fig. 1. **Development and Modifications of Instrumentality-Expectancy Theory.**

There is some question as to whether Graen's (1969) modification of Vroom's (1964) theory and the Porter and Lawler (1968a) versions should be considered separate or not. Heneman and Schwab (1972) argue that from the standpoint of predicting employee performance, they are essentially the same. Since this paper deals primarily with a theoretical approach to satisfaction, it is felt that there is an important distinction, having to do with the relationship between performance and satisfaction. Therefore, in this paper the two will be treated as alternative versions of expectancy theory.

Vroom's (1964) Model. Since Vroom's (1964) model was the starting point, it seems appropriate to begin with a discussion of the concepts of his model. The central concepts were valence, instrumentality, expectancy, and force. Each of these will be discussed in the following paragraphs.

Vroom (1964) begins with the basic assumption that individuals have preferences among various "states of nature." He refers to these states of nature as Outcomes. Preferences among Outcomes are based on feelings of attraction (positive or negative) or indifference toward these Outcomes. Such feelings of positive or negative affect, Vroom (1964) calls valence. Valence is defined as "affective orientations toward particular outcomes [p. 15]." Since individuals desire to obtain certain outcomes, to avoid others, and are indifferent to still others, it is assumed that valences can take a wide range of positive and negative values. One other point should be mentioned about valence. Vroom (1964) explicitly distinguishes between valence and value. An Outcome may have high valence (anticipated satisfaction) and low value (realized satisfaction). Thus, valence always refers to the anticipated satisfaction from an Outcome.

Vroom's (1964) use of the term, "Outcome," was somewhat confusing. Galbraith and Cummings (1967) clarified this by suggesting the concepts of "first" and "second" level Outcomes. This is particularly important in discussing the concept of instrumentality. Using Galbraith and Cummings' (1967) terms, instrumentality can be defined as the likelihood that a first-level Outcome will lead to a particular second-level Outcome. According to Vroom (1964), this is not a probability since it takes values ranging from +1, indicating certainty that a second-level Outcome will follow from the first-level Outcome, to −1, indicating certainty that the first-level Outcome will not lead to a particular second-level Outcome. Instrumentality might be considered to be a "perceived correlation" between first- and second-level Outcomes (Graen, 1969).

Job satisfaction in terms of Vroom's (1964) model can be accounted for with the two concepts of instrumentality and valence. It is defined as "the valence of the job or work role to the person performing it [p. 101]."

A slight rewording of Vroom's (1964) Proposition 1 provides a more formal definition of satisfaction. The valence of a first-level outcome (i.e., job) to the person performing a job is a monotonically increasing function of the algebraic sum of the products of the values of all second-level outcomes and his conceptions of its instrumentality for the attainment of these second-level outcomes.

This definition of satisfaction can be expressed as follows:

$$JS_j = \sum_{i}^{N} (V_i \cdot I_{ji})$$

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JS_j = Satisfaction with job (j) or outcome (j)

V_i = Valence of second-level outcome i

I_{ji} = Instrumentality of job j for outcome i

The remaining concepts in Vroom's (1964) model are expectancy and force. Expectancy is a probabilistic concept indicating an individual's subjective probability that performing an act will lead to a particular first-level Outcome. Since it is a probabilistic concept, it takes values ranging from 0, indicating no probability, to 1, indicating certainty that the act will lead to the Outcome. Force is a motivational concept and involves the concepts of expectancy and valence. It is defined by Vroom's (1964) Proposition 2.

> The force on a person to perform an act is a monotonically increasing function of the algebraic sum of the products of the valences of all outcomes and the strength of his expectancies that the act will be followed by the attainment of these outcomes [p. 18].

This can be stated as follows:

$$F_i = \sum_{j=1}^{N} (E_{ij} \cdot V_j)$$

where F_i = Force to perform act i

E_{ij} = Expectancy that act i will lead to outcome j

V_j = Valence of first-level outcome j

Graen's (1969) Modification of Vroom's (1964) Model. Graen (1969) proposes a "modest extension [p. 2]" of Vroom's (1964) model. First, Graen (1969) suggests the use of role concepts to help clarify the distinction between first- and second-level Outcomes. Attainment of a work role (e.g., becoming a job incumbent) is considered to be a first-level Outcome. As a result of becoming a job incumbent certain conditions result such as pay, status, and responsibility. These conditions are considered to be second-level Outcomes.

Another clarification which seems to be even more important to the present discussion is Graen's (1969) discussion of the context in which this conceptual framework is placed. This context is the "work personality – work role system [p. 2]." "Work personality, is defined, in part, as a person's preferences for various consequences of attaining work roles and his dispositions for perceiving and evaluating various instrumentality and expectancy relationships [p. 2]." On the other hand, "work role, is defined as a set of behaviors expected by the organization and considered appropriate of an incumbent of a position within the organization [p. 2]." Graen (1969) provides examples of work roles including occupational group member, effective job performer, incumbent in a particular job, team member, and leader.

The expectancy theory, under discussion, views all work behaviors as outputs of this work personality – work role system. The basic unit of concern centers around an individual work personality in a work role. In discussing this system, Graen (1969) is giving attention to both individual (work personality) and situational (work role) factors. In this respect, Graen (1969) has explicitly broadened the concern of the theory. However, Graen's (1969) original model, discussed previously, has no mechanism for handling these situational variables.

After conducting an experiment to test various aspects of this expectancy formulation, Graen (1969) suggested additional modifications which add considerable complexity to the model and allow one to incorporate certain situational variables. These variables fall into the category of perceived external pressures to perform.

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It is important to note that the expectancy model deals with situational variables as they are perceived by the actor rather than variables as they might be "objectively" measured or estimated by someone other than the actor. The model assumes that it is the perceived value of the variable which affects the individual's subsequent attitudes and behavior.

Graen's (1969) test of the theory led to a clarification of the conditions under which expectancy predictions would relate to job satisfaction and performance. The methodology employed in the research allowed the manipulation of an organization climate variable. Three climates were experimentally generated: reciprocating, prompting, and control. The reciprocating climate made rewards contingent on performance. The prompting climate used extra payment as an inducement for future performance, rather than offer it contingent on past performance. The control climate used no rewards in addition to regular pay. The results suggest that expectancy predictions are consistently supported only for the reciprocating climate.

The implications of these results are interesting. First, it seems to support the idea that the "actual" rewards provided by the job (the "actual" instrumentality) bear a significant relationship to the "perceived" rewards (or "perceived" instrumentalities). If this is the case, it would be possible and, it seems, useful to measure the "actual" instrumentalities associated with various positions for purposes of counseling, selection and classification, job engineering, etc. (The need-fulfillment theories to be discussed subsequently take this approach)

Second, it would appear that this result can be turned around to say that the extent to which one can demonstrate support for expectancy predictions can be taken as an index of the extent to which the organization has developed a climate where rewards are contingent on performance. In this sense, the expectancy model could be used as a diagnostic tool to "measure" presence of a reciprocating climate. (A similar idea has been presented by Porter and Lawler, 1968a)

The Lawler and Porter (1967a, 1967b) Models. Two other researchers in the area of work motivation currently employing the instrumentality theory approach are Lawler and Porter (1967a, 1967b). In a series of articles (Lawler & Porter, 1967a, 1967b; Lawler, 1968b; Porter & Lawler, 1968a, 1968b), these authors have presented both theoretical models and research testing their models in a managerial environment. Their work has served to extend instrumentality theory and also put satisfaction research into a new perspective. Their extension of instrumentality theory attempts to further explain the relationship between motivation and performance.

One of their earlier articles (Lawler & Porter, 1967a), presents a theoretical model relating job attitudes to performance. This model borrows heavily from earlier instrumentality approaches to work motivation, most notably Vroom (1964) and Georgopoulos et al., (1957). The principal attitudinal components of the model are (*a*) value of rewards, and (*b*) effort-rewards probability. Value of rewards (*cf.*, Vroom's (1964) valence) is defined "as the attractiveness of possible rewards or outcomes to the individual [p. 125]." The second variable, effort-rewards probability, refers to a subjective expectancy that a desired reward will follow from putting forth certain levels of effort. This variable includes Vroom's (1964) concept of expectancy or the probability that performance will lead to rewards, and the probability that performance results from effort.

The concept of effort according to Lawler and Porter (1967a) is the amount of energy an individual expends in a particular situation. The following diagram (Figure 2) is useful in explaining how the variables interact in the model.

The rule explaining how value of rewards and effort-rewards probability interact to produce the level of effort is stated as follows:

> *The greater the value of a set of rewards and the higher the probability that receiving each of these rewards depends upon effort, the greater the effort that will be put forth in a given situation* [Lawler & Porter, 1967a, p. 128].

The remaining two variables in the model, abilities and role perceptions, which mediate the relationship between effort and performance, take into account relatively permanent characteristics of the individual as well as situational aspects of the work environment. Abilities may be considered crudely to be the individual's "power to perform." Role perceptions refer to the individual's perception of the types of

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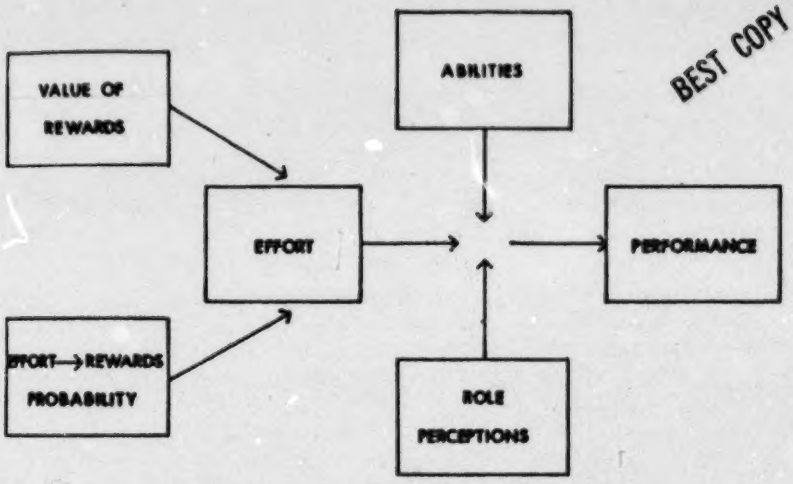

Fig. 2. **Theoretical Interaction Model Relating Job Attitudes and Performance.**
(Lawler & Porter, 1967a, p. 125, Fig. 1)

activities and behaviors which he should perform to accomplish his job successfully. Role perceptions may be accurate or inaccurate depending on how closely they agree with the expectations of those evaluating performance.

Lawler and Porter (1967b) treat satisfaction somewhat differently as a function of performance. Their model of job satisfaction is shown in Figure 3. Performance leads to two types of rewards, intrinsic and extrinsic. Extrinsic rewards are seen as imperfectly related to performance due to the difficulty of making rewards such as pay, promotion, status, security, etc., contingent on performance. Since performance, especially for managerial jobs, is difficult to measure, it is difficult for organizations to dispense rewards strictly on the basis of performance.

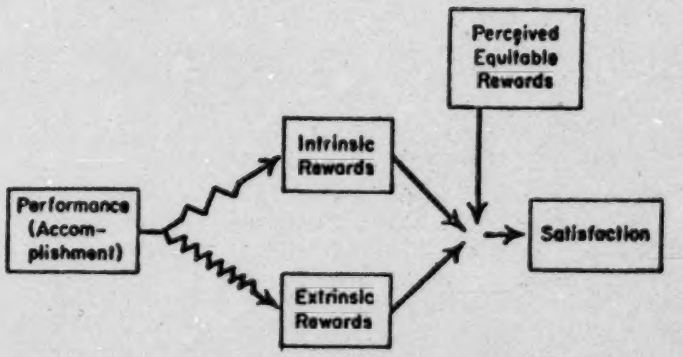

Fig. 3. **Theoretical Model Regarding Performance and Job Satisfaction.**
(Lawler & Porter, 1967b, p. 23, Fig. 1)

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For intrinsic rewards, however, Lawler and Porter (1967b) contend that the situation is different. These rewards, such as feelings of accomplishment, can be given by the incumbent to himself. Thus, the relationship between intrinsic rewards and performance is seen as more direct. In expectancy theory terms, the instrumentality of performance for intrinsic rewards is higher than it is for extrinsic rewards. Furthermore, according to Lawler and Porter (1967b), the individual's satisfaction is assumed to be dependent not only on the amount and type of rewards received for performance, but also on what he perceives as a fair level of rewards.

Comparison of Various Expectancy Models. For the present report, the important comparison between the various models is in terms of their handling of satisfaction. A discussion of the manner in which the Porter and Lawler (1968a) and Vroom (1964) models deal with performance is given in Heneman and Schwab (1972). The present discussion will attempt to point out similarities and differences in the various approaches in explaining satisfaction.

Vroom (1964) and Graen (1969) argue that satisfaction (work role attraction) is a monotonically increasing function of the products of the instrumentality of the work role for attaining certain role Outcomes and the desirability (valence) of these Outcomes. Porter and Lawler (1968a) contend that satisfaction is a function of performance, rewards, and perceived equitable rewards. One obvious difference between the two formulations is the inclusion of the equity concept in the Porter and Lawler (1968a) formulation. That is, the relationship between rewards and satisfaction is mediated by the individual's perception of whether or not the level of rewards meets some internal standard of "equitable" level of rewards.

A second and primary difference is concerned with the relationship between satisfaction and performance. Lawler and Porter (1967a, 1967b) and Porter and Lawler (1968a) explicitly state that satisfaction is, in part, a function of performance. In other words, satisfaction is an "output" of the model. The Vroom (1964) and Graen (1969) formulations are somewhat vague on the effects of performance on satisfaction. The emphasis of the model, however, is upon satisfaction as an input to the work performance model. This is stated explicitly in Vroom's (1964) Proposition 2 where the "valence of a work role" combines with expectancy to predict the probability of an act. Thus, in one model, Lawler and Porter (1967a, 1967b), considered satisfaction to be an output. In Vroom (1964) and Graen's (1969) formulation, satisfaction is seen to be an input.

It is not immediately clear to what extent this represents substantive differences in the models or whether the apparent difference results from a failure to describe both models in "dynamic" terms as opposed to "static" formulations. If a model is conceived as operating through time, it is immediately clear that the outputs at Time 1 will be inputs at Time 2, assuming some sort of feedback mechanism. In this sense, whether something is called an input or an output is quite arbitrary depending on which phase of the model one observes. This point can be illustrated by observation of the more complete version of the Porter and Lawler (1968a, p. 165) expectancy model pictured as Figure 4.

Figure 4 depicts satisfaction to be an output of the model. The level of satisfaction combines (in some unspecified way) with value of reward which is an input. To the extent that satisfaction and value of reward are different, the Porter and Lawler (1968a) model is different from the Vroom (1964) and Graen (1969) models. However, if satisfaction and value of reward are the same or very highly related, then even though one is an input and the other an output, the models are quite similar.

Thus, the crucial question in comparing the two models concerns a comparison of the way satisfaction is conceptualized by the two models. The question boils down to one of whether the conceptualization of satisfaction as an input in the Vroom (1964) model and as an output in the Porter and Lawler (1968a) model reflect substantive differences. Vroom (1964) and Graen (1969) defined satisfaction with a work role (valence of a work role) as the sum of the products of the valences of the Outcomes of that work role and the instrumentalities of the work role for attaining those Outcomes (see Proposition 1). Such satisfaction is, as stated explicitly, anticipated rather than realized satisfaction. In Vroom's (1964) model then, satisfaction is future oriented and concerned with fulfillment which is expected. For Porter and Lawler (1968a), however, satisfaction is defined differently. Satisfaction in this model is a reaction to past events; it is past rather than future oriented. It is concerned with fulfillment in the past and whether the fulfillment was "fair" or "equitable" according to some internal standard. Thus, it appears that the two conceptualizations of job satisfaction are different, and the differences are primarily in terms of orientation. The Porter and Lawler's (1968a) model is oriented toward the past while Vroom's (1964) and Graen's (1969) models are more future-oriented.

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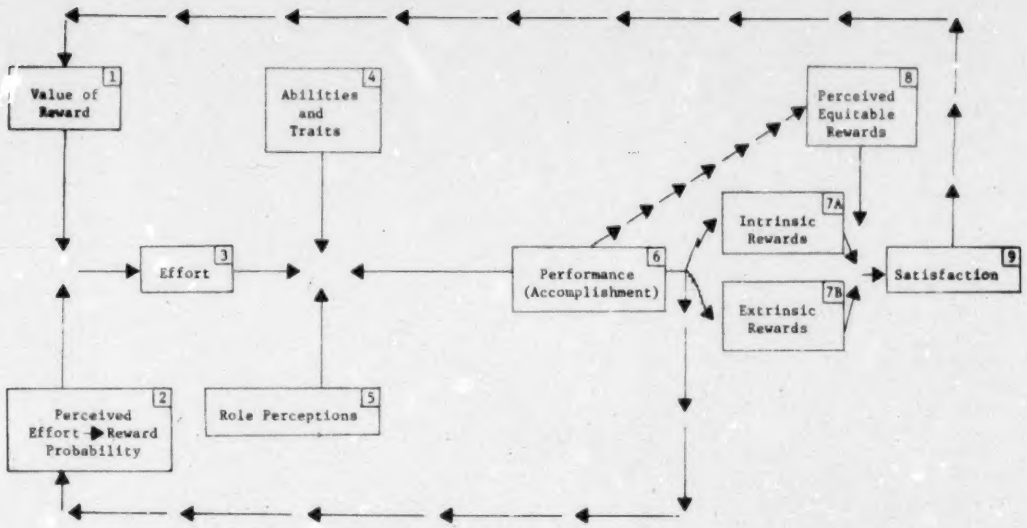

Fig. 4. **Revised Diagram of the Theoretical Expectancy Model.**
(Porter & Lawler, 1968a, p. 165, Exhibit B)

This difference would have implications for explaining or predicting relationships between job attitudes and behavior. The Vroom (1964) model and the Graen (1969) model would predict that an increase in satisfaction would lead to an increase in the force to perform an act if expectancy is unchanged. Porter and Lawler's (1968a) formulation would predict that an increase in satisfaction would affect performance very indirectly. It would have a significant effect only if it affected the variable "value of rewards." On the other hand, in the Porter and Lawler (1968a) model, a change in performance has the potential for influencing satisfaction assuming that rewards are contingent on performance. The effects of performance on satisfaction in Vroom's (1964) and Graen's (1969) models are not specified.

Heneman and Schwab (1972) conclude that the various versions of expectancy theory are essentially equivalent in terms of their explanation of performance. Based on the foregoing discussion, such a conclusion does not seem warranted in terms of the various models' approaches to satisfaction.

Assessment of Expectancy Theory. Expectancy theory is primarily a theory of the individual, and attempts to explain the process factors affecting the individual's choices between alternative acts or behaviors. The theory has undergone several modifications since its original statement by Vroom (1964), including those of Graen (1969). The most comprehensive version is the Porter and Lawler (1968a) statement of the theory.

The expectancy theories presented by the preceding authors provide a useful way of conceptualizing the relationships among a number of variables affecting work motivation. The theories are perhaps most useful in accounting for the motivation and satisfaction of someone performing in the role of job incumbent. As devices for predicting the level of satisfaction and motivation of prospective job incumbents the theories are less useful. This is because the expectancy and instrumentality values for prospective incumbents would likely be different from the values for the same individual if he became a job incumbent. Only if the individual were given very detailed and accurate information about the work activities required by the job, the performance – reward relationship, and the rewards provided by the job, would the theory accurately predict satisfaction for an individual before he entered the job.

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A difficulty with the use of the theory as a basis for the Air Force job satisfaction program is the absence of any well developed, standardized measures of the variables comprising the theory. Thus, a researcher would need to develop his own measuring instruments or use some crude measures developed by others. This latter approach would involve using measures with largely untested psychrometric characteristics. However, until well developed measures exist, the full utility of expectancy theory will not be known.

A recent article (House & Wahba, 1972) points out that most work dealing with expectancy theory is based on the assumption that individuals attempt to maximize positive Outcomes. These authors note that the maximizing criterion is subject to question in light of recent research dealing with choice behavior.

The assumption that individuals attempt to maximize positive Outcomes could also be questioned in light of the equity theory considerations previously discussed. Maximization could lead to a state of overpayment inequity which presumably would be dissatisfying to the individual. Since Porter and Lawler (1968a) include equity considerations in their version of the theory this criticism has, to some degree, been satisfied.

Despite the above disadvantages, expectancy theory remains the most explicit, and perhaps the most promising theory of work motivation. It is still evolving as is indicated by the recent work of House and Wahba (1972), among others. As the concepts become more clearly defined, and when adequate measures are developed, this approach may well provide a means for dealing with the complexities of human work motivation. At the present time, however, expectancy theory is not sufficiently developed to provide the needed conceptual base for the Air Force satisfaction research program.

Cornell Studies of Satisfactions

Basic Concepts. The Cornell Studies of Satisfactions, unlike some of the other approaches discussed, present a "little bit of theory and a great deal of data." The research conducted in this program has been based on a rather general conceptual model, and has dealt very systematically and painstakingly with many of the very difficult issues which confront attitude research in general and job attitudes in particular. The most comprehensive statement of this approach is contained in *The Measurement of Satisfaction in Work and Retirement* (Smith, Kendall, & Hulin, 1969). This is the primary source for the discussion which follows, and unlike the other four theories, a description of the different versions and modifications to this theory is not attempted.

The history of this approach is in many ways the history of the development and validation of a measuring instrument – the Job Description Inventory (JDI). The discussion that follows will be organized in a manner which reflects that orientation. The first section will deal with the justification for measuring satisfaction. Other sections will include the conceptual model, measurement problems and issues, construction of the JDI, and brief considerations in validation of the JDI.

Why Measure Job Satisfaction. Smith et al., (1969) argue that the study of satisfaction is important for several reasons. First, to understand the sources of satisfaction and dissatisfaction is important in and of itself for humanitarian reasons. Second, it is important because managers and policy makers believe that it is important. Much of the concern of management and unions is with issues which are expected to affect the attitudes of workers. Therefore, they are interested in evaluating the impact of these decisions and programs on expressed attitudes. Finally, it is important to the theoretician who is interested in the dynamics of human motivation. Thus, study of satisfaction with the job, and the determinants of such attitudes, would be expected to contribute to the broader psychology of attitudes and human motivation.

Each of these might be sufficient justification for studying satisfaction. Each also requires an adequate measure of satisfaction in order to make study of the determinants of job attitudes possible. Smith and her associates (1969) felt that existing measures were inadequate for failing to satisfy one or more criteria of an adequate measuring instrument, such as expense of use, standardization, separation of various facets of satisfaction, reliability, and validity. Therefore, they reasoned that a new inventory should be constructed which hopefully would satisfy these criteria.

Conceptual Model. The authors prefer to speak of job satisfactions rather than a single concept of job satisfaction. In this context job satisfactions are defined as *"feelings or affective responses to facets of the situation* [Smith et al., 1969, p. 6]."

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In a single passage the authors spell out in very general terms the conceptual model underlying their work. Their description is as follows:

> We hypothesize that these feelings are associated with a perceived difference between what is expected as a fair and reasonable return (or, when the evaluation of future prospects is involved, what is aspired to) and what is experienced, in relation to the alternatives available in a given situation. Their relation to behavior depends upon the way in which the individual expects that form of behavior to help him achieve the goals he has accepted [Smith et al., 1969, p. 6].

This model, as stated, explicitly embraces both equity and instrumentality – expectancy notions. In addition, it adds the idea of "available alternatives" which is not explicitly dealt with by other leading theories of satisfaction.

This model is elaborated somewhat in a later passage:

> Job satisfactions are, we believe, a function of the perceived characteristics of the job in relation to an individual's frames of reference. Alternatives available in given situations, expectations, and experience play important roles in providing the relevant frame of reference [Smith et al., 1969, p. 12].

Frames of Reference. Smith et al., (1969) assign a prominent position in their model to the concept of frame of reference. Two primary features of one's frame of reference are considered: These are the person's general adaptation level and his anchor points or alternatives.

General adaptation level. Smith et al., (1969) borrow the adaptation level concept from Helson (1948, 1964). The adaptation level represents a "weighted geometric mean of all the stimuli or situations within the experience of the person [p. 13]." Although Smith et al.,'s (1969) use of the concept is somewhat vague, it is assumed that it serves as a psychological mid-point for one's frame of reference.

Anchor Points. The anchor points or alternatives define "the end points of his perceived scale [Smith et al., 1969, p. 13]." Smith et al., (1969) assume that the individual's perception of the best available job defines the positive end point and his perception of the worst job he can imagine defines the negative end point.

The functioning of the frame of reference is described as follows:

> Frame of reference is the internal standard (or standards) a person uses in making an evaluation. This standard is related to his prior experience, his set (or predilection) for making a given response, his expectations, and his threshold for change in a given stimulus dimension [Smith et al., 1969, p. 13].

Dimensions Related to Frames of Reference. Time Perspective is "The frame of reference of a person may range from the consideration of his lifetime values to the minute-by-minute rewards of a particular job [Smith et al., 1969, p. 14]." It is postulated that attitude statements vary along the time perspective dimension. Some statements may deal with short-term transitory aspects of the job while others deal with longer term and presumably more stable aspects of the job.

It is further proposed that different forms of behavior are differentially related to various time perspectives. Decisions dealing with job choice or change of career fields would be expected to relate to the long term aspects, while the decision to take an unauthorized work break would be related to a more momentary time perspective.

Absolute and Relative Measures. It is assumed that the frame of reference contains a continuum ranging from judgments made on the basis of some internal standard to judgments made on the basis of comparisons with other jobs, people, situations, etc. The first type of judgment which might be considered an absolute judgment is related to expectations concerning fair input/output ratios based on one's internal standard of what constitutes a fair day's work. This is assumed to be culturally determined.

The other end of the dimension, relative judgments, involve considerations of the input/output ratio of some comparison group. The equity of one's own ratio is judged in relation to the perceived ratio of this comparison person or group. The comparison person or group may represent others in the same or similar job, or it may be the ratios available in other jobs available to him. The determination of the comparison group is assumed to be strongly influenced by one's work history and experience. Smith et al., (1969) claim that "absolute judgments are more closely linked to the general adaptation level, and relative judgments to end points or anchors [p. 16]."

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Descriptive and Evaluative Measures. Attitude statements can be considered to be arrayed along a continuum of objectivity. On one hand are specific statements dealing with observable aspects of the situation, i.e., temperature, humidity, cleanliness, etc. On the other hand are statements which ask for subjective reactions to the situation. It would be expected, according to Smith et al., (1969) that the latter subjective statements would be most affected by differing frames of reference.

Implications of the Research for Job Satisfaction. It is not correct to refer to the Cornell Studies as providing a theory of job satisfaction. Rather, in the words of Smith et al., (1969), their purpose is to "report a strategy for the study of attitudes [p. 160]." As a result, those aspects of this strategy which have been supported by the data can be useful to other researchers interested in job satisfaction. Thus, this section will attempt to summarize very briefly various implications of the "strategy."

1. An adequate model of satisfaction must take into account interactive effects among variables.

2. Relationships between satisfaction and overt behavior vary from situation to situation.

3. Relationships between satisfaction and behavior cannot be reasonably expected unless the behavior can be considered to be an appropriate means of expressing satisfaction and dissatisfaction.

4. The manner in which questions are asked affects the time perspective of the respondent, and therefore affects the alternatives he considers.

5. "Satisfaction is a product of other variables, and it may or may not serve as a cause in itself [Smith et al., 1969, p. 162]."

6. There may be a relationship between satisfaction and behavior since the same variables producing the satisfaction might also produce the behavior, or changes in behavior may act to change the situation and, therefore, satisfaction.

7. The relationship between satisfaction and performance will vary depending on the aspect of the job being studied.

8. The importance of each aspect of the job situation influences the individual's feeling of satisfaction. Importance is considered to be a function of the discrepancy between the existing situation and the alternatives available.

9. Legitimacy, the group norms defining the legitimate requirements for a job for a specified group, influence the acceptance of a task and the attitude toward it.

10. "It is, therefore, the interrelationships of objective factors of the job, of individual capacities and experience, of alternatives available in the company and the community, and of the values of the individual, that can be expected to predict satisfaction and performance [Smith et al., 1969, p. 165]."

Assessment of Cornell Studies. The summary statement, number 10, describes a general "model" which might serve as a useful guide to any job satisfaction theory builder. It is acknowledged that satisfaction and performance are outputs from the interactions among individual and situational variables. Smith and her associates (1969) however, make few generalizations as to the nature of these relationships. Thus, there is no theory which can be ascertained from the Cornell Studies.

The basic value or contribution of this extensive program of research has been the development of a measuring instrument and the discussion of a number of complex issues which confront the job satisfaction researcher. Anyone claiming a comprehensive approach must successfully deal with the issues posed by Smith and her associates (1969) in their "strategy for the study of attitudes [p. 160]."

Need Fulfillment Theory

Basic Concepts and Modifications. This approach to job satisfaction is based on the idea that individuals have certain needs and that jobs satisfy these needs in varying degrees. Satisfaction is synonymous with need fulfillment, much as satisfaction is dealt with by Lawler and Porter (1967b).

Most of the work in this area has concentrated on the needs of the individuals. These include Maslow's (1943) need hierarchy and Alderfer's (1969) Existence, Relatedness, and Growth (E.R.G.) Theory. Neither of these theorists dealt with variations in environments in terms of the opportunity for need fulfillment. The focus was on the individual and the hypothesized dynamics of his need system.

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One program of research, however, has taken into account both the needs of the individual and the "reinforcers" in the work environment. This work based on the Theory of Work Adjustment (Dawis, England, & Lofquist, 1964; Dawis, Lofquist, & Weiss, 1968) makes considerable use of the concept of individual-environment fit. As such it represents one of the few attempts to deal with both individual and situational variables.

This discussion will center on three approaches to work motivation. The Maslow (1943) scheme will be discussed first, followed by the Alderfer (1969) model, and then the Theory of Work Adjustment (Dawis et al., 1964; 1968).

Maslow's (1943) Need Hierarchy Theory. Maslow (1943) proposed a theory of motivation which also incorporated a taxonomy of needs, namely: (*a*) physiological, (*b*) safety, (*c*) love, (*d*) esteem, and (*e*) self-actualization. These "basic" needs are related to one another, according to Maslow (1943), in a hierarchical fashion with self-actualization at the top of the hierarchy and the physiological needs at the bottom, or most basic, level. Maslow (1943) posits the idea of prepotency, which says that the most basic unsatisfied need will be prepotent; i.e., will dominate the individual's attention and prevent the emergence of the "higher" needs. In other words, "man lives by bread alone--when there is no bread [Maslow, 1943, p. 375]." The ultimate goal of man according to Maslow (1943) is self-actualization. However, because of the hierarchical arrangement of needs, self-actualization can occur only after the "lower-order" needs have been relatively well satisfied.

Several studies have been conducted which have applied Maslow's (1943) concept of need hierarchy to work motivation. In a series of studies, Porter (1961, 1962, 1963a, 1963b, 1963c), concerned with need satisfaction of managers, found evidence that need satisfaction varied as a function of position level. In the third study in the series, Porter (1963a) found that higher level managers placed more importance on self-actualization than did lower level managers. This seems to indicate support for Maslow's (1943) assertion of the hierarchical arrangement of needs, if one makes the assumption that higher level managers have greater satisfaction of the basic or lower-order needs.

Due to the cross-sectional nature of Porter's (1961, 1962, 1963a, 1963b, 1963c) work, his results did not provide conclusive support for Maslow's (1943) position, since his research design did not rule out the possible explanation that the need patterns existed prior to the manager's promotion to high management positions. Thus, the greater importance attributed to self-actualization may have been a cause rather than a result of their promotion.

Recognizing this design deficiency, Hall and Nougaim (1968) tested predictions from the Maslow (1943) model in a longitudinal study employing data from management trainees over a five-year period. The specific hypotheses tested in the study were as follows:

> Hypothesis I: Within a given year, the satisfaction of a given level of needs will be positively correlated with the strength of the needs at the next higher level (static analysis).
>
> Hypothesis II: From one year to the next, changes in the satisfaction of a given level of needs will be positively correlated with changes in the strength of the needs at the next-higher level (change analysis).
>
> Hypothesis III: After five years of employment, successful managers will show lower need strength and higher satisfaction in the safety needs than will their less successful colleagues. Thus, they will show higher achievement and self-actualization need strength than will the less successful group (success analysis). [Hall & Nougaim, 1968, p. 16].

The results indicate that in neither the static nor change analysis were there any substantial correlations between need satisfaction and need strength at the next level. The highest correlation was .23 between Affiliation satisfaction and the strength at the next higher level (Achievement and Esteem). Thus, Hall and Nougaim (1968) conclude that their data provide no evidence to support the notion of a need hierarchy. Even when they collapsed the three higher levels into a single level yielding a two-stage model, the hierarchy notion was not supported. Based on their data, the authors suggest an alternative model which they call a career stage model. According to this model, an individual moves through various stages of career development, and each stage carries with it a concern for various types of need satisfaction. These stages might be described in terms of such primary concerns as: (*a*) concern for security, (*b*) concern for promotion and achievement, and (*c*) higher-order concerns related to actualization. The difference between the career stage and the hierarchy model is that career passage occurs not because of satisfaction at lower levels, but

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> as a result of fairly regular status passages which are facilitated by both the environment (i.e., role factors) and the individual (i.e., developmental life stages, . . .). And these status passages can occur largely independent of the man's degree of perceived success in satisfying the concerns he experienced at the earlier stages [Hall & Nougaim, 1968, p. 29].

The authors' evidence supports this view since both high and low success managers (as measured by advancement) showed similar patterns of need changes during the five-year period of the study.

Alderfer's (1969) E.R.G. Theory. An alternative theory of human needs has been proposed by Alderfer (1969). Alderfer (1969) postulates three categories of needs: (*a*) Existence, (*b*) Relatedness, and (*c*) Growth. Although these needs are assumed to be arranged in a hierarchy, this does not seem to be a strictly ordered hierarchy. According to Alderfer (1969), this means that lower-order gratification is not a prerequisite for the emergence of the higher-order needs.

Existence needs are those which deal with material and physiological desires. Their objectives can be reduced to material substances or physical states. The satisfiers of existence needs are usually characterized by the condition that, when resources are limited, one person's gain is another person's loss; that is, the food eaten by Person A is not available for Person B.

Relatedness needs are those needs for social relationships with significant others. Basic to relatedness-need satisfaction is the idea of sharing or mutuality. The satisfaction of relatedness needs may not always result in a positive affective state for all parties involved. It may include the exchange or expression of anger or hostility, as well as the exchange or expression of love or friendship.

"*Growth* needs include all the needs which involve a person making creative or productive effects on himself and the environment [Alderfer, 1969, p. 146]." Satisfaction of growth needs results from engaging in activities which require an individual to utilize his capabilities and develop new abilities. Involved in growth needs is the striving on the part of the individual to become what he is capable of becoming.

The relationship of Alderfer's (1969) needs to Maslow's (1943) may be depicted as shown in Figure 5. Alderfer's (1969) Existence includes Maslow's (1943) physiological needs plus those needs related to physical safety. Relatedness includes the need for security, love needs, and the need for self-esteem which, in turn, depends upon regard from others. Finally, self-esteem deriving from the individual's self-awareness and self-actualization are included in the Growth needs.

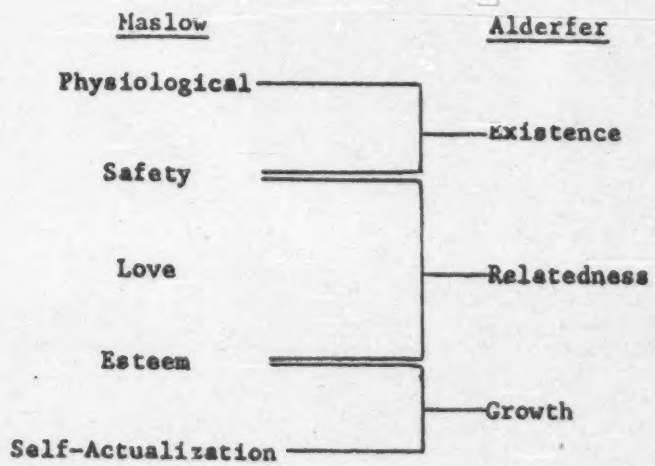

Fig. 5. Comparison of Maslow (1943) and Alderfer (1969) E.R.G. Needs Categories.

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Alderfer (1969) states that this categorization, in contrast to Maslow's (1943) formulation, makes no strictly-ordered, hierarchical assumption. If the categories do lie on a dimension, it might be considered a dimension of concreteness-abstractness with Existence being the most concrete and Growth the least concrete of the needs.

Alderfer (1969) states seven propositions which explain the functioning of the need system. In some of these propositions we see influences from Maslow's (1943) hierarchy; notably, Propositions 3 and 6. In addition to this, Alderfer (1969) incorporates into Propositions 2 and 5 the frustration-regression hypothesis, which states that frustration of need satisfaction at one level will lead to regression to seek satisfaction at a more concrete level. Propositions 1 and 4 are derived from the simple frustration hypothesis indicating that the more something is denied, the more it is desired. Finally, Proposition 7 follows from research on aspiration level, which has shown that when one attains a certain level of growth he sets a higher goal. The seven propositions are as follows:

P1. The less existence needs are satisfied, the more they will be desired.

P2. The less relatedness needs are satisfied, the more existence needs will be desired.

P3. The more existence needs are satisfied, the more relatedness needs will be desired.

P4. The less relatedness needs are satisfied, the more they will be desired.

P5. The less growth needs are satisfied, the more relatedness needs will be desired.

P6. The more relatedness needs are satisfied, the more growth needs will be desired.

P7. The more growth needs are satisfied, the more they will be desired [Alderfer. 1969, p. 148].

Alderfer (1969) points out the similarities and differences between his E.R.G. theory and the Maslow (1943) theory. Propositions 2 and 5 represent departures from Maslow (1943). Both of these propositions are concerned with the increased desire for lower-order, previously satisfied needs as a result of lack of satisfaction for the next higher level of needs. Maslow's (1943) model maintains that satisfied needs lose their determining or organizing role.

Proposition 7 is another departure from the notion that satisfied needs are no longer motivators. This proposition is a departure from Maslow's (1943) original ideas but in agreement with his later statement that "Growth is instead a continued, more or less steady upward or forward development (1968, p. 33)."

Another departure from Maslow (1943) results from the classification of needs into three rather than five categories. Since Maslow's (1943) security needs and esteem needs fall into separate E.R.G. categories, different predictions are made for these two needs.

Alderfer's (1969) study tested 21 hypotheses. Three of these were derived exclusively from Maslow (1943), ten exclusively from the E.R.G., and the remaining eight from a combination of E.R.G. and Maslow (1943) needs in E.R.G. Proposition 4. Thus, support for the two models can be compared. If the cross-theory predictions are supported, they can be taken as support for the E.R.G. theory since the study utilized a proposition from E.R.G. theory to make the predictions.

Although the results showed support for one of the three Maslow (1943) predictions, this support was based on only one correlation of .15 ($p<.05$). On the other hand, eight of the ten hypotheses derived from the Alderfer (1969) model were supported by significant correlations ranging from .15 to .49, with several reaching the .995 confidence level. The results from the cross-theory predictions showed some support for four predictions and strong support for one, thus giving some support for five out of eight predictions. This, as mentioned earlier, represents support for the E.R.G. model since the predictions were made using E.R.G. and Maslow's (1943) needs in E.R.G. Proposition 4. In essence, these results show that predictions involving Maslow's (1943) needs received greater support when generated from the E.R.G. theory than when derived from Maslow's (1943) theory.

Alderfer (1969) qualified his results by stating that the lack of support for the Maslow (1943) predictions may have been due to the measures used. The measures used for the Maslow (1943) needs were less reliable than those used for the E.R.G. needs, possibly because Alderfer (1969) relied on measures developed by others for the Maslow (1943) needs to avoid introducing his own bias into the instrument construction. Furthermore, it may have been more difficult to operationalize the Maslow (1943) needs, which are more difficult to separate conceptually, than the E.R.G. needs.

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Even with these qualifications, the results of Alderfer's (1969) study together with those of Hall and Nougaim (1968) raise some question concerning the utility of the Maslow (1943) theory as an explanatory device. Perhaps the idea that needs appear in a strictly ordered hierarchy, with higher-order needs becoming more important as lower-order needs are satisfied, is an oversimplified notion. These results suggest that more research using a relatively complex theory, such as E.R.G., is required.

Theory of Work Adjustment. The Work Adjustment Project at the University of Minnesota represents a careful, systematic effort to study and explain the process through which individuals adapt to the world of work. One purpose of this project is to facilitate the practice of vocational counseling by providing conceptual and concrete tools for intervention into the process of work adjustment. The work of the project is based on the Theory of Work Adjustment (Dawis et al., 1964, 1968).

The theory assumes that *"each individual seeks to achieve and maintain correspondence with his environment* [Dawis et al., 1968, p. 3]." This correspondence is defined in terms of the relationships between the work personality and the work environment. Work personality can be thought of as a set of work-relevant dimensions along which people vary. The dimensions with which the theory deals are skills and needs. Work environment represents a set of dimensions along which jobs can be said to vary. These include skill requirements and rewards.

The concept of correspondence can be described in terms of these dimensions. The worker brings his individual work personality to the work environment. His work personality consists of a number of skills and a set of needs. A particular work environment, or position, requires certain skills on the part of the worker and, in turn, provides the worker certain rewards. *"Correspondence can be described in terms of the individual fulfilling the requirements of the work environment, and the work environment fulfilling the requirements of the individual* [Dawis et al., 1968, p. 3]."

There are ways in which the goodness of fit, or correspondence, can be evaluated. The most basic indicator of correspondence is tenure which refers to the length of time a person remains in a particular position. It is assumed by the theory to be a function of the correspondence between the individual and the work environment.

The above definition of correspondence makes use of two separate criteria: (*a*) the individual satisfying the requirements of the position, and (*b*) the position satisfying the requirements of the individual. The terms used by the theory to refer to these two conditions are "satisfactoriness" and "satisfaction." Satisfactoriness represents the extent to which the individual is judged by the organization to be a satisfactory worker. An individual's satisfaction is assumed to reflect the extent to which the organization meets his needs.

This formulation of the theory makes it possible to describe the work personality and the work environment on comparable dimensions. As mentioned above, the work personality can be defined in terms of skills and needs; work environments may be defined in terms of skill requirements and reinforcers.

With the above assumptions and concepts identified, the theory may be stated more formally in terms of the following propositions and corollaries.

Proposition I. An individual's work adjustment at any point in time is indicated by his concurrent levels of satisfactoriness and satisfaction.

Proposition II. Satisfactoriness is a function of the correspondence between an individual's abilities and the ability requirements of the work environment, provided that the individual's needs correspond with the reinforcer system of the work environment.

Corollary IIa. Knowledge of an individual's abilities and of his satisfactoriness permits the determination of the effective ability requirements of the work environment.

Corollary IIb. Knowledge of the ability requirements of the work environment and of an individual's satisfactoriness permits the inference of an individual's abilities.

Proposition III. Satisfaction is a function of the correspondence between the reinforcer system of the work environment and the individual's needs, provided that the individual's abilities correspond with the ability requirements of the work environment.

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Corollary IIIa. Knowledge of an individual's needs and of his satisfaction permits the determination of the effective reinforcer system of the work environment for the individual.

Corollary IIIb. Knowledge of the reinforcer system of the work environment and of an individual's satisfaction permits the inference of an individual's needs.

Proposition IV. Satisfaction moderates the functional relationship between satisfactoriness and ability-requirement correspondence.

Proposition V. Satisfactoriness moderates the functional relationship between satisfaction and need-reinforcer correspondence.

Proposition VI. The probability of an individual being forced out of the work environment is inversely related to his satisfactoriness.

Proposition VII. The probability of an individual voluntarily leaving the work environment is inversely related to his satisfaction.

Combing Propositions VI and VII, we have:

Proposition VII. Tenure is a joint function of satisfactoriness and satisfaction.

Given Propositions II, III, and VIII, this corollary follows:

Corollary VIIIa. Tenure is a function of ability-requirement and need-reinforcer correspondence.

Proposition IX. Work personality-work environment correspondence increases as a function of tenure [Dawis et al., 1968, pp. 9-11].

Assessment of Need Fulfillment Theory. The Theory of Work Adjustment provides the best example, from those considered, of a theory which has been operationalized. Well developed measures of needs, reinforcers, satisfaction, and satisfactoriness exist. As such it has been possible to test and to verify many of the predictions made by the Theory of Work Adjustment. Support for its predictions involving job satisfaction has been quite consistent.

One weakness of the approach lies in the range of variables considered. The Theory of Work Adjustment assumes that the work personality is composed of two sets of variables; needs, and abilities. Undoubtedly, there are other sets of variables which could profitably be included such as interest and life history variables. The basic model, however, could be expanded to include other variables such as those mentioned.

A second weakness lies in the lack of an adequate definition of "correspondence." A basic proposition of the theory is that satisfaction is a function of the "correspondence" between the reinforcers of the work environment and the individual's needs. The exact nature of this correspondence, however, is never specified. Various indices of correspondence were tested in a study by Betz (1971), but the issue remains unresolved. Presumably the most satisfactory index is a simple difference measure, but more work directed toward this issue is needed.

Although the set of variables comprising the Theory of Work Adjustment is not comprehensive, the model still has implications for the Air Force satisfaction research program. The concept of work personality can be employed to include, in addition to abilities and needs, other variables such as interest and life history or biographical variables. The work environment can be enlarged to include, in addition to reinforcers and ability requirements, other job and organizational variables. As such, the task analysis technology developed by the Air Force would be integrated into such a framework. In this framework, job satisfaction would then be considered an output of the work personality – work environment interaction. Thus, the Theory of Work Adjustment seems to provide one of the more useful frameworks for the Air Force research program. However, certain modifications and additions to this approach are required for comprehensiveness. Suggestions for incorporating the concepts of the Theory of Work Adjustment into the Air Force approach are presented in the Implications section which follows.

III. IMPLICATIONS FOR AIR FORCE JOB SATISFACTION RESEARCH

Introduction: Purpose and Objectives

Purpose. This section will describe objectives of the long range Air Force job satisfaction/career decision research program and will attempt to draw implications for this program from the preceding review

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of theories of job satisfaction. The preceding review omitted much discussion of data bearing on the theories considered. This section will attempt to support statements or assumptions developed from the existing data. Information will also be presented regarding the use of job satisfaction theories in military services research studies, and offer recommendations regarding a theoretical position for Air Force job satisfaction research. The long range objectives and use of theories in military research are considered before commencing to draw implications and considering sets of job satisfaction variables.

Objectives of the Satisfaction Research Program. The Air Force program in job satisfaction as currently envisioned has four primary objectives: (*a*) defining and measuring those variables assumed to be related to the career decision process, (*b*) empirically demonstrating relationships between this set of variables and career decisions, (*c*) determining the relationships between job changes and career orientation variables, and (*d*) making recommendations for job or policy changes which will impact on these variables in positive ways. Obviously, these four objectives describe a very ambitious undertaking. In addition, the general terms in which they are stated leave a large number of unanswered questions. Some possible approaches toward the accomplishment of these objectives are suggested later in the report, but emphasis is placed on the implications of the theories previously discussed for the first preceding objective (i.e., the determination of variables to be measured).

Use of Theories in Military Services Research. Traditionally, there were reasons to expect that the military services would make little use of any particular theoretical orientation in work motivation/job satisfaction research, due to the applied nature of its personnel research and the correspondingly rather small amount of theory development in industrial psychology. Such a situation, however, does not appear to have created any singularly notable weakness in terms of the variety or amount of research in the area of present concern, as is demonstrated subsequently.

As part of the long-range job satisfaction research previously described, an intensive review was undertaken to identify job satisfaction-retention work motivation studies in the military services. While this effort was outside the scope of the present report, over 284 studies were identified. These reports were then screened to determine studies which reviewed or involved any of the five major theories of job satisfaction.

Table 1 represents an attempt to summarize and consolidate certain information from 37 military studies or reports involving satisfaction-work motivation theories in varying degrees ranging from mere citation of a reference to the use of theory as a central part of a study. References are listed separately for each branch of service by date of publication except where related studies are placed adjacently for convenience. Various comments and classifications representing the present authors' interpretation of the reports are also provided in order to explain and elaborate the nature of the reports. Certain trends and observations derived from the references are discussed.

As a general statement, rather surprisingly, the military services have made fair to moderate use of theories in job satisfaction, motivation, and retention research. The Navy was most active in the area with 21 reports, followed by the Army and Air Force with 8 reports each. The Office of Naval Research (ONR), either by grant or contract, appears to have been the most active agency, and supported some theory development with other than military samples. These ONR studies are listed separately for convenience. Additionally, the University of Minnesota's Center for Study of Organizational Performance and Human Effectiveness (COPHE) (Davis, Pinto, & Dawis, 1972; Dunnette, 1973; Dunnette & Campbell, 1971; Pritchard et al., 1972) deserves special mention for its research on expectancy and equity theories and the theory of need adjustment. As noted in Table 1, frequent literature reviews were undertaken. Additional information on these reviews is given in Appendix A.

Time wise, the earlier studies which first appeared around 1960 (e.g., Whitlock, 1960) were mainly literature reviews of motivation and satisfaction which included some theory citations. In the mid-1960's, more specific studies involving need-fulfillment, particularly need hierarchy and two-factor theories, began to appear. Later (circa late 1960's and early 1970's), there was an increase in both number of studies and variety with several expectancy theories, a few equity theories, the Cornell Studies, and Alderfer's (1969) need-oriented studies, being published. This latter increase in military studies corresponds with the increased attention to theory development in the civilian sector. However, there was still considerable interest in two-factor theory during the more recent period. Generally, across all services, two-factor theory followed closely by need-fulfillment theories were used most frequently. To the extent these studies are representative of the military situation and because it was one of the first theories developed, the Herzberg

Table 1. **Summary of Military Studies Involving Job Satisfaction or Work Motivation Theories**

Military Service [a]	Reference/Source	Type of Report [b]	Sample or Population [c]	Additional Comments [d]
A	Marcrum (1966)	Other	Officers. Capt – Col	Need (Maslow)
A	Nadel and Mowbray (1966)	Review	Varied	Extensive references including Two-Factor and others
A	Franklin et al. (1968)	Other	Company Grade Officers	Two-Factor and Need
A	Johnson and Marcrum (1968)	Other	Officers. Capt – Col	Need (Maslow, Porter) Cross reference Marcrum
A	Macedonia (1969)	Specific	USMA Cadets	Need (Murray)
A	Butler and McLaughlin (1971)	Specific	USMA Officer Graduates	Need (Maslow) and Two-Factor
A	McLaughlin and Butler (1971)	Specific	USMA Graduates	Need and Two-Factor
A	Drucker and Schwartz (1972)	Specific	Enlisted NCOs	Need (Maslow)
AF	Whitlock (1960)	Review	Varied	Extensive reference of morale measurement. Includes Two-Factor.
AF	Cureton (1960)	Specific	Enlisted	Two Factor
AF	Miller (1966) Vol I and II. New View	Specific	Junior Officers	Two-Factor. Also extensive bibliography
AF	Department of the Air Force AFM 35-16 (1968)	Specific	AF Personnel	Need (Maslow) and Two-Factor. Cross reference. New View.
AF	Porter and Mitchell (1967)	Specific	Officer and NCOs	Need (Maslow; Porter and Lawler)
AF	Thomas (1970)	Review	Varied and Officers	Extensive bibliography. Also references to Two-Factor, Need and Vroom (Expectancy)
AF	Calclasure (1971)	Review	Varied	Extensive bibliography. Need, Two-Factor, Porter et al., Vroom and other theories.
AF	Atchison and Lefferts (1972)	Specific	Officer – Pilots	Two-Factor (primarily) and equity (Porter et al.) Cross-reference New View
N	Githens (1966)	Specific	Junior Officers	Two-Factor
N(ONR)	Dunnette (1968)	Review	Varied and Naval Personnel	Expectancy, Need (theory work adjustment) and others
N(ONR)	Nealey (1970; 1972)	Review	Enlisted	Extensive references. Several theories: Two-Factor, equity, expectancy, Cornell Studies.
N	Stoloff (1971)	Other	Enlisted	Theory review. Need, Expectancy, Cornell Studies, Two-Factor (emphasized)
N(ONR)	England et al. (1971; 1972)	Specific	Officers	Development of model (theory) relation: values and behavior. COPHE.
N(ONR)	Mitchell and Albright (1972)	Specific	Naval Aviators	Expectancy
N	Neumann et al. (1972)	Specific	Junior Officers	Two-Factor
N(ONR)	Porter and Steers (1972)	Review	Varied	Extensive review of literature/theories. Turnover and absenteeism.
N	Goldman (1973)	Specific	Enlisted	Need and Two-Factor
N	Goldsamt (1973)	Other	Navy Recruits	Extensive references various theories
N	Porter (1970)	Review	Marginal members of work force	Theoretical report – rewards/motivation, Expectancy.
N(ONR)	Pritchard et al. (1972)	Other	Male college students	Equity (primarily) and expectancy. COPHE.
N(ONR)	Tornow and Dunnette (1970)	Specific	Male college students	Equity. COPHE.
N(ONR)	Dunnette and Campbell (1971)	Other	Varied	COPHE Progress Report. Expectancy and Equity plus review.

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Table 1 (*Continued*)

Military Service[a]	Reference/Source	Type of Report[b]	Sample or Population[c]	Additional Comments[d]
N(ONR)	Davis et al. (1972)	Specific	Retail Managers	Need (Theory Work Adjustment)
N(ONR)	Motowidlo, Loehr and Dunnette (1972)	Specific	Male undergraduates	Expectancy. COPHE.
N(ONR)	Schneider (1973)	Review	Varied	Considerable references. Various theories.
N(ONR)	Dunnette (1973)	Specific	Varied	Theory review. Expectancy, equity (primarily) and Two-Factor. COPHE.
N(ONR)	Alderfer (1972)[e]		Varied	Need

[a]Branch of military service which either conducted, sponsored, or primarily concerned with study or report. A = Army; AF = Air Force; N = Navy or Marine Corps; ONR = Office of Naval Research.

[b]According to authors' interpretation, the report may possibly be classified as mainly belonging to one of the following categories: **Review.** General literature review and/or mentions several theories of satisfaction and motivation without particular emphasis. Typically contains extensive reference list or bibliography. **Specific.** Generally concerned with one or two specific theories. **Other.** Does not fit two preceding categories, e.g., Review but also with particular emphasis.

[c]Sample, group or population with which study was essentially concerned. Enlisted or officer (commissioned) refers to personnel in designated branch of service. **Varied** refers to a variety of samples, mixed civilian/military studies, or sample classification not appropriate due to nature of study.

[d]Supplemental comments regarding some relevant aspect of report. For brevity, some exposition of comments are as follows: **Two-Factor.** Herzberg Two-Factor Theory of primary emphasis in study. **Equity, Expectancy.** These theories were of primary emphasis in report. **COPHE.** Center for Study of Organizational Performance and Human Effectiveness, University of Minnesota. **Need.** Need Fulfillment Theory (e.g., Maslow, Murray, Dawis, et al.)

[e]Alderfer. Based on work unit summary: Defense Documentation Center, Arlington, Va. Navy: ONR Unit NR-170-817. In DDC Report No. T16750, 6 July 1972. Mentions Alderfer's theoretical orientation.

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et al., (1959) two-factor theory has been predominant. However, there is a definite trend toward more use of expectancy, equity, and other theories such as the Theory of Work Adjustment (Dawis et al., 1964).

Although there were numerous studies involving theories which were concerned with either enlisted samples or all types of military personnel, the majority of these reports seemed concerned with military cadets and officers, particularly young or junior officers. Brief comments regarding several of these studies are provided in order to illustrate the nature of this research emphasis and to support certain of the preceding conclusions.

The Army and Air Force both conducted major studies regarding retention and motivation of company grade officers. A "New View" study by Miller (1966), using the Herzberg (1966) two-factor theory, was adopted by the Air Force to develop a career motivation manual (Department of the Air Force, AFM 35-16, 1968). The Atchison and Lefferts (1972) report involved a follow-up of Air Force pilots from the "New View" study. The Army study by Franklin, Braybrook, Farber, Crawshaw, Stern, and Blair (1968) investigated the relationship between intrinsic/extrinsic factors (i.e. two-factor theory) and job satisfaction and retention. Army cadets' satisfaction and career intent were investigated by Butler and McLaughlin (1971) and McLaughlin and Butler (1971) using need-fullfillment and two-factor theory. In contrast, one of the more specific studies using a theory other than two-factor was the report by Mitchell and Albright (1972) which involved expectancy theory. In general, all the preceding citations found a relationship between job satisfaction and career intention.

Another trend noted from several reports was the increased study of values of junior officers (Githens, 1966; Neumann, Abrahams, & Githens, 1972). In fact, England, Olsen, Agarwal, and Rydel (1971) and England, Agarwal, Rydel, and Olsen (1972), developed a theoretical model of the relationship between values and behavior of Naval officers.

Sets and Categories of Variables. As previously mentioned, the present concern is primarily with the first objective of the long range Air Force research program (i.e., identification and measurement of sets of variables assumed related to career decision). One major benefit of the theories which have been reviewed is that they serve to identify variables which are presumably related to job satisfaction. By considering a number of different approaches, one can be assured that the variables identified by others will be considered. The present discussion borrows from the theories previously reviewed and in addition includes other variables not treated by the theories which could be related to the career decision process.

In discussing variables related to career decision, it is convenient to discuss them under the arbitrary categories; individual, situational, individual-situational, and output variables. This distinction between individual and situational variables corresponds roughly to the concepts of work personality and work environment discussed in the theory of Work Adjustment (Dawis et al., 1968). Also, the terms individual and situational were used by Ronan (1970) in a review of variables related to job satisfaction. However, Ronan (1970) did not explicitly define the meaning of the terms for his use.

For the present discussion, Individual variables are assumed to be measurable characteristics of individuals which are reasonably stable across situations. Included in such a definition are such variables as abilities or aptitudes, interests, needs, and life history (biographical) variables.

Situational variables, on the other hand, are assumed to be measurable characteristics of work situations which are relatively stable and independent of a particular incumbent. Included as situational variables are Ability requirement estimates, reinforcers provided by the job, indices of job content, and physical characteristics of the geographical location of the job.

The above conceptualization of situational variables is similar to that of The Theory of Work Adjustment (Dawis et al., 1968) and assumes that the values of the variables can be determined "objectively." Adopting this approach might involve either direct measurement of some types of variables such as temperature, noise, etc., or ratings made by knowledgeable raters with the "objective" value being an average or some other value determined from the ratings.

Individual-situational variables are variables which represent the influence of both individual and situational factors. This category includes the variables defined by expectancy theory such as instrumentality, expectancy, valence, and force. These variables essentially involve individual interactions with situations. There are no "objective" values of these variables which apply across situations or individuals. It is assumed that there is a value for each of these variables for each individual-situation interaction.

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Output variables are variables which result from the individual-situational interaction. Essentially, these variables are the output of the individual-work role interaction. The two sets of output variables of interest in the present discussion are satisfaction and satisfactoriness.

Implications of Theories – Individual Variables

Each of the theories discussed above, except two-factor theory, includes variables which might be considered individual variables. An attempt will be made to sort through these variables and determine the unique contributions of each theory, as well as to determine the variables which are shared by two or more approaches.

Abilities. The Theory of Work Adjustment (Dawis et al., 1968) defines the individual work personality in terms of aptitudes and needs. Lawler and Porter (1967b) include abilities in their model, but are not explicit in defining what abilities should be included. Many different aptitudes and abilities have been defined and measured. The Theory of Work Adjustment concentrates on the aptitudes measured by the General Aptitude Test Battery (GATB), (U. S. Department of Labor, 1967). A recent monograph (Neeb, Cunningham, & Pass, 1971) presents a list of cognitive abilities with definitions. This list was adapted from those described by French, Ekstrom and Price (1963), and is presented in Table 2. This latter list is more comprehensive than the others mentioned as a useful list of aptitude or ability variables.

Table 2. **List of Cognitive Abilities**

Closure	Spelling
Form Perception	Expressional Fluency
Perceptual Speed	Ideational Fluency
Spatial Scanning	Sensitivity to Problems
Spatial Orientation	Deductive Reasoning
Visualization	Inductive Reasoning
Number Facility	Originality
Memory	Social Intelligence
Verbal Comprehension	Aesthetic Judgment
Grammar	Musical Aptitude

In addition to abilities or aptitudes expressed in terms of test scores, it might be useful to consider "perceived abilities." The rationale for such a set of variables could be based on the idea that it's not really important what an individual's "actual" abilities are unless they agree with his perception of his abilities. In terms of his choice of a job, or his willingness to undertake a particular task, it is likely to be his perception of his own abilities which exert the greatest influence. Therefore, to the extent that an individual's measured or actual abilities differ from his perceived abilities, predictions of his behavior based on actual abilities would differ from predictions based on perceived abilities.

The discrepancy between actual and perceived abilities is likely to vary from individual to individual. This discrepancy would be expected to vary, at least in part, as a function of tenure or experience. In some respects, the size of this discrepancy might be taken as an indicator of occupational adjustment, since well-adjusted individuals would be expected to have a realistic perception of their abilities. In this regard, the discrepancy might be an important indicator for first-term airmen who, as a group, would be expected to show more variance in this index than more experienced individuals.

The previous discussion has been primarily concerned with the level of actual and perceived abilities. An additional dimension suggested by equity theory formulations deals with the importance or value of the abilities. In equity theory terms, this would be the perceived importance of the inputs where the perceived abilities are perceived as a relevant input to the work situation.

The variable, value of abilities, would be expected to vary somewhat independently of ability level. For example, assume an individual was presented a list of 10 abilities or aptitudes to be rank ordered, first on the basis of his perceived level on each separate ability and then again on the basis of the importance of each of the abilities. If the two dimensions do vary separately, the two orderings would be expected to

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differ. If this could be demonstrated, then value of the ability could be interacted with ability (value times ability level) to form separate predictor variables for each ability dimension.

Needs. Although perhaps less stable than aptitude, needs are another important set of individual variables. The Theory of Work Adjustment defines needs as *"preferences for responding in certain stimulus conditions which have been experienced to be reinforcing* [Dawis et al., 1968, p. 9]." Another definition of needs was given by Tuttle and Cunningham (1972). Needs can be considered to be "preferences for (tendencies to approach or avoid) various classes of conditions and outcomes associated with work situations [Tuttle & Cunningham, 1972, p. 47]." Defined in this way, needs are similar to Vroom's (1964) concept of the valence of outcomes and Porter and Lawler's (1968a) concept of Value of Reward. All refer to affective orientations toward outcomes, situations, or characteristics of the work setting. Although there are some subtle differences in the concepts, operationally it probably doesn't make much difference which approach one takes. A more important question relates to the dimensions of concern. Whether one is listing outcomes, rewards, or needs, the final list would probably be highly similar. Thus, this review will use the concept of need as used in The Theory of Work Adjustment (Dawis et al., 1968). The original list of needs defined by The Theory of Work Adjustment included 20 needs which are measured by the Minnesota Importance Questionnaire (MIQ). These needs with an item representative of each are listed in Table 3.

Table 3. **Scales[a] and Sample Items from the Minnesota Importance Questionnaire (MIQ)**

	MIQ Scale Need	Representative Item
1.	Ability utilization	I could do something that makes use of my abilities.
2.	Achievement	The job could give me a feeling of accomplishment.
3.	Activity	I could be busy all the time.
4.	Advancement	The job would provide an opportunity for advancement.
5.	Authority	I could tell people what to do.
6.	Company policies and practices	The company would administer its policies fairly.
7.	Compensation	My pay would compare well with that of other workers.
8.	Co-workers	My co-workers would be easy to make friends with.
9.	Creativity	I could try out some of my own ideas.
10.	Independence	I could work alone on the job.
11.	Moral values	I could do the work without feeling that it is morally wrong.
12.	Recognition	I could get recognition for the work I do.
13.	Responsibility	I could make decisions on my own.
14.	Security	The job would provide for steady employment.
15.	Social service	I could do things for other people.
16.	Social Status	I could be "somebody" in the community.
17.	Supervision-human relations	My boss would back up his men (with top management).
18.	Supervision-technical	My boss would train his men well.
19.	Variety	I could do something different every day.
20.	Working conditions	The job would have good working conditions.

[a]Although Tables 3, 5, and 7 have somewhat similar scales or dimension titles, the illustrative or sample items are stated differently. Consequently, for reader convenience the tables are presented separately.

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The needs defined in Table 3 represent a reasonably thorough listing of need dimensions which have relevance for the work situation. For any particular situation or organization, one might wish to augment this list by adding other dimensions. However, these represent a good beginning towards developing a comprehensive listing of important need dimensions.

Vocational Interests. An important set of variables with relevance for work behavior are interests, particularly vocational interests. Considerable literature has developed in the area of interest measurement. There are a number of well established interest measures such as the Kuder Preference Record (Kuder, 1966), the Strong Vocational Interest Blank (SVIB) (Strong & Campbell, 1966), the Minnesota Vocational Interest Inventory (Clark & Campbell, 1965), and a more recently developed and promising inventory, the Ohio Vocational Interest Survey (OVIS) (D'Costa, Winefordner, Odgers, & Koons, 1970). Although interest measurement is by no means a newcomer to the measurement scene and the value of the constructs have been demonstrated in vocational guidance, theories of work motivation and satisfaction have been slow to include interests as a relevant set of variables. This seems a serious shortcoming of the theories, in view of the rather obvious motivational implications of the interest concept.

A number of interest dimensions have been identified by the various inventories. There is considerable overlap among the content of the inventories and the major differences appear to be a function of level of specificity rather than differences in the domain or population of interests measured. A comparison between the scales of three inventories are presented in Table 4.

Table 4. **Scales on the Kuder Preference Record, Strong Vocational Interest Blank, and Ohio Vocational Interest Survey**

Kuder Preference Record Vocational Scales	SVIB Basic Scales	OVIS Scales
Artistic	Adventure	Agriculture
Clerical	Agriculture	Applied Technology
Computational	Art	Appraisal
Literary	Business/Management	Artistic
Mechanical	Law/Politics	Care of People/Animals
Musical	Mathematics	Clerical Work
Outdoor	Mechanical	Crafts and Precise Operations
Persuasive	Medical Service	Customer Services
Scientific	Merchandising	Entertainment & Performing Arts
Social Service	Military Activities	Inspecting and Testing
	Music	Literary
	Nature	Machine Work
	Office Practices	Management and Supervision
	Public Speaking	Manual Work
	Recreational Leadership	Medical
	Religious Activities	Music
	Sales	Numerical
	Science	Nursing & Related Tech Services
	Social Science	Personal Service
	Teaching	Promotion and Communication
	Technical Supervision	Sales Representative
	Writing	Skilled Personal Services
		Teaching/Counseling & Social Work
		Training

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The scales presented in Table 4 do not give a complete picture of the scope of the SVIB and the Kuder Preference Record (1966). In addition to the scales presented, the SVIB has occupational scoring keys for a number of occupational areas. The Kuder Preference Record – Vocational (1966) from which the above scales are obtained, is only one of a family of interest inventories developed by Kuder (1966) and his associates.

The scales in Table 4 represent three separate approaches to the definition of the vocational interest domain. The approaches used to generate the particular scales differed considerably. Despite the different approaches however, there is considerable agreement among the three in terms of the boundaries of the vocational interest domain.

Life History Variables. This category of variables includes those typically measured by biographical inventories, job application blanks, and similar measurement devices. There is little agreement among researchers employing such variables in terms of what dimensions comprise the domain of life history information. Considerable progress has been made in this direction however, based on recent work by Owens (1971) and his associates (Schoenfeldt, 1970).

Despite the generally agreed utility and the widespread use of life history variables for various purposes, none of the leading theories of job satisfaction has explicitly encompassed this set of variables. Presumably some of the effects of different patterns of life history would be reflected in variables which are included in the theories. That is, different backgrounds and experiences would presumably lead to different valences, interests, and needs. However, it is quite likely that life history variables would contribute additional unique variance which is not reflected in the other sets of variables. In addition, life history variables offer some advantages from the measurement viewpoint. Many variables which are classified as life history variables are considerably more verifiable and objective than attitudinal or preference variables.

Although life history variables have not explicitly entered into theoretical formulations, they have proven useful in various empirical studies. Examples are work by Hulin (1966) and Hulin and Blood (1968) which demonstrated differing responses of workers to job characteristics as a function of certain life history variables.

On the basis of the above studies and the work of Owens (1971) and his associates (Schoenfeldt, 1970) discussed earlier, life history variables would appear to be an indispensable set of variables in any comprehensive approach to the study of job satisfaction.

Frame of Reference. The Cornell studies in Satisfactions (Smith et al., 1969) emphasize the concept of frame of reference. In their discussion of the concept, two dimensions related to frame of reference are discussed. These are anchor points and adaptation level. It is assumed that for any judgment being made, the individual has a subjective response continuum. The ends of this continuum are referred to as his anchor points and the zero point is considered to be his adaptation level. In discussing the functioning of the frame of reference, Smith et al., (1969) state that the frame of reference serves as an internal standard or set of standards by which evaluations are made.

In terms of the implications for job satisfaction, this seems to be a potentially useful concept, although one which is somewhat hazy. The utility would depend on one's success in operationalizing the concept. If this could be done, it would facilitate interpretation of satisfaction scores. Absolute level of satisfaction scores would not be as important as the level relative to the anchor points. For example, two individuals might have the same absolute score on a satisfaction dimension. However, for Person A the score could be near the positive extreme in his frame of reference while the score for Person B, on the other hand, could be near the zero point of his frame of reference. In this case, the same two scores would be interpreted quite differently for the two individuals. The absolute satisfaction score would indicate that Person A was quite satisfied and Person B was only neutral.

One approach to operationalizing this concept is suggested by Free and Cantril (1968). The technique is called the self-anchoring scale, and represents an approach to allowing the respondent to define the anchor points on his subjective scale or frame of reference. Applying this technique to the study of satisfaction might be done as illustrated in Figure 6.

Regarding the essential aspects of the techniques portrayed in Figure 6, the respondent is asked to describe his ideal Air Force job and the worst job he could be assigned in the Air Force. These two descriptions define the end points on his "subjective" job satisfaction or job choice scale. Then, item No. 1

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A. Based on your knowledge of Air Force specialties and your abilities and interests, briefly describe the best possible job to which you could be assigned.

_____

B. Now, briefly describe the worst possible job to which you could be assigned.

_____

C. Below is a scale with 9 steps. Let step number 9 be the best possible job you described above, and let step number 1 be the worst possible job you described. In terms of this scale, answer the questions below.

1	2	3	4	5	6	7	8	9
Worst Possible								Best Possible

	Write the number of your answer in this column
1. On what step of this scale would your present job be placed?	1. _____
2. On what step would you place the best job you might receive in your present career ladder?	2. _____
3. On what step would you place the worst job you might receive in your present career ladder?	3. _____

Fig. 6. **Illustration for Application of Self Anchoring Scale.**

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in Figure 6, dealing with the individual's present job, becomes a measure of overall job satisfaction which takes into account his frame of reference. Item No. 2 and 3 allow one to measure the individual's perception of the amount of satisfaction he is likely to obtain by remaining in his present career ladder. The extent that the value in item No. 2 is different from "9" represents a measure of perceived mis-assignment. The individual apparently feels that there are other Air Force jobs or career fields in which he would be more satisfied.

Such an approach could be used for measuring overall satisfaction, or the technique could apply to each of several dimensions of satisfaction. Obtaining such information, in addition to scaled satisfaction information, would allow the scaled data to be interpreted in terms of one's frame of reference. A tryout of the self anchoring scale is currently in progress in a job satisfaction survey of the Munitions and Weapons Systems Maintenance career ladder.

Implications of Theories – Situational Variables

In the present classification schema there are two types of situational variables. First, there are characteristics of situations – variables which describe work situations and environments in "objective terms" apart from the point of view of any perceiver. Second, there are individual reactions to situations. This second set of variables constitute perceived aspects of the situation and are specific to particular individuals.

Ability Requirements. The Theory of Work Adjustment includes a set of variables which are the levels of aptitude required in a job on each of the aptitude dimensions measured by the General Aptitude Test Battery (GATB). Since the Theory of Work Adjustment argues that satisfactoriness is a function of the correspondence between an individual's aptitude profile and the ability requirements of the occupation, it is necessary to have the two sets of variables defined in terms of comparable dimensions.

The Air Force is currently engaged in research concerning the setting of aptitude level requirements in selected career fields (Fugill, 1972). This approach yields an estimate of the overall aptitude level required to perform tasks in each of a number of similar career ladders. Since the approach to data has only been concerned with tasks which are reasonably homogeneous in terms of aptitude content requirements, the problem of setting aptitude content requirements has been avoided. For the purpose for which the technique was used, this presents few problems. The results allow one to determine, for the career ladders studied, where current aptitude requirements could be lowered with a minimum impact on mission effectiveness.

For other purposes, i.e., assigning an individual to a career ladder in which the pattern of specific aptitudes required best matches his aptitude score profile, it might be desirable to have information concerning the requirements of a career ladder for specific aptitudes. This brings in the joint questions of aptitude level and content. Although it would be a time consuming, expensive undertaking to attempt to empirically determine aptitude level and content requirements for each career ladder and for a number of aptitude dimensions, such a process should have payoff in terms of improving the "match" between the aptitudes of the individual and the aptitude requirements of the job. If such an approach were adopted, it would be desirable to estimate aptitude requirements for those aptitude dimensions which are measured by selection and classification test batteries.

Interest "Requirements."[2] In addition to matching individuals with jobs or career ladders in terms of ability versus ability requirement correspondence, it would also be desirable to increase compatibility between individual interests and interest requirements of jobs. Occupational analysis techniques have much to offer in terms of determining the pattern of interests most likely to lead to satisfaction with the work content.

The rationale for this approach is based on the assumption that individuals vary in their preferences for work activities or types of tasks. On the other hand, different career ladders vary in terms of the types of tasks performed by members of the ladder. Very simply, it is assumed that individuals who have the

[2]The term requirement as used is somewhat as a misnomer. It is intended to mean requirements, not in terms of prerequisites for performance, but requirements for satisfaction. An individual with an interest profile matching the interest "requirement" profile would be more likely to be satisfied than one whose profile differed from the "required" profile.

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opportunity to perform tasks which they prefer will be more satisfied than individuals who perform non-preferred tasks. This assumption has received support from longitudinal studies with the Strong Vocational Interest Blank and the Kuder Preference Record (1966). Longitudinal research with the SVIB has shown that individuals tend to enter and remain in occupations for which they receive high SVIB scores (Anastasi, 1968). Validation of the Kuder Preference Record (1966) against a job satisfaction criterion in a longitudinal study covering approximately 10 years has shown that the percentage of satisfied individuals in jobs classified as "consistent" with their original interest patterns was greater than the percentage of dissatisfied people. The percentages were 62 percent for the consistent group and 34 percent for the inconsistent group. On the other hand, the percentage of dissatisfied workers was 8 percent in the consistent group as opposed to 25 percent for the inconsistent group (Anastasi, 1968). Thus, there is some longitudinal evidence from the civilian sector to support the argument that interest versus interest requirement compatibility is positively related to both tenure and satisfaction. Additionally, in the military services, the U. S. Navy has actively investigated the use of interest inventories to predict career motivation and retention. Since 1964 the SVIB has been given to various officer groups and data from a scale developed (SVIB N-6) consistently showed a relation with career decision (Abrahams & Neumann, 1971). The Navy Vocational Interest Inventory (NVII) has been used to study the performance and career motivation of enlisted personnel (Abrahams, Lau, & Neumann, 1968).

In order for the Air Force to make use of interest measures for selection and classification purposes, it is necessary to establish optimum interest requirement profiles for career ladders. There are at least two approaches to this problem, both of which are well established in the literature.

One approach involves separating individuals in a career ladder or career fields into criterion groups on the basis of a criterion such as job satisfaction. Interest items (i.e., activity preferences) could be administered to individuals in both groups. An empirical scoring key could then be developed giving greatest weight to items which maximally separate the satisfied and dissatisfied groups.

Since the Air Force currently has considered research underway along the lines of this approach, additional elaboration is warranted. In a comprehensive literature review on career motivation, Culclasure (1971) suggested that a screening procedure involving the SVIB and other scales should be reasonably successful in predicting retention. Usdin and Shenk (1973) also investigated background and interest tests for predicting officer retention. While the approach previously outlined would optimally require the development of approximately 47 keys in order to consider all Air Force enlisted career fields, a similar approach on a smaller number of career fields is currently being attempted.[3]

A second approach would involve defining, either empirically or rationally, a set of task content or interest dimensions which cover the entire interest domain in the Air Force. Similar approaches are seen in the previous discussion of scales from various interest inventories. The extensive occupational analysis data at the task level would provide relevant input to this procedure. After a comprehensive set of descriptors were defined, it would be possible to use judgments of individuals in the field to establish the relevance of each interest dimension for each career ladder or career field. Once interest requirement profiles were established for career ladders and measures of these interests developed, a basis would exist for assigning individuals to career fields or career ladders in terms of the similarity between an individual's measured interest profile and the required profile of the career ladder or field. The utility of the system would depend on the comprehensiveness of the dimensions, the meaningfulness of the dimensions to raters in the field, and the development of adequate measures for each of the dimensions.

A potential spinoff from such a system could have impact in the recruiting area. Since recruiting will perhaps become more difficult with the absence of the draft, any new potential recruiting tool should be considered. If the recruiter were provided information concerning the interest profile requirements of various career ladders he would be better able to counsel prospective enlistees and provide more realistic expectations of the work activities each career ladder provided. This is important from the job satisfaction point of view, since there is research to suggest that satisfaction is higher and longer tenure more likely for

[3]Personal Communication with Dr Nancy Guinn, Personnel Research Division, AFHRL, 31 Jan 1973. A study is in progress to develop interest scales from the Vocational and Occupational Interest Choice Examination (VOICE) for eight airmen occupational groups (DAFSCs).

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those who enter an organization with realistic expectations concerning the work activities and requirements (Macedonia, 1969; Weitz, 1956). In addition, if an interest inventory were administered to the potential enlistees, it would be relatively simple to develop a computerized system which would allow the recruiter to compare the measured profile with each career ladder and discuss with the individual those with the greatest overlap. In addition to the initial advantages accruing to the Air Force personnel system, such a system would provide additional advantages after the individuals are on active duty, such as better screening of individuals for cross-training or reassignment and improved counseling of individuals who are returning to the civilian labor market.

Potential Reinforcers. Four of the theories discussed incorporate the concept of reinforcers within their framework. The relevance of this set of variables to satisfaction is one of the few areas of agreement among four of the theoretical approaches.[4] However, despite the agreement on the value of the concept, each of the theories handles the concept somewhat differently and employs a different term or terms to refer to essentially the same idea.

The two-factor theory deals exclusively with reinforcers. The terms used to refer to classes of reinforcers are "motivators" and "hygienes," or "satisfiers" and "dissatisfiers." Under each of these classes are several specific dimensions. Among those factors considered to be satisfiers are Achievement, Recognition, Work Itself, Responsibility, and Advancement. The list of dissatisfiers includes Company Policy and Administration, Supervision-Technical Salary, Interpersonal Relations-Supervision, and Working Conditions. Examination of this list makes it easy to see why the first set of factors are also referred to as "intrinsic" factors and the second set, the dissatisfiers, are often called "extrinsic" factors.

Equity theory handles the concept of reinforcers with its concept of outcomes. Outcomes are perceived rewards or returns to the individual. The primary outcomes considered by research with the equity concept have been economic outcomes. Undoubtedly, these are a significant set of variables to consider. However, as pointed out by Adams (1965), any variable which the recipient considers relevant and which has marginal utility for him is considered by the theory to be an outcome. Thus, the outcome concept is much broader than it has been treated by researchers and can include intrinsic as well as extrinsic outcomes, and both positive and negative outcomes. Equity theory itself makes no effort to define the relevant outcomes, recognizing that they may vary from job to job and from person to person within similar jobs.

The term outcomes is also applied to reinforcers by one version of expectancy theory (Vroom, 1964). Essentially the same concept is labeled reward by Porter and Lawler (1968a) and is broken down into intrinsic and extrinsic rewards. Neither of these approaches attempt to define the total range of outcomes (rewards) considered by the theory.

The most systematic and comprehensive treatment of reinforcers appears in the Theory of Work Adjustment (Dawis et al., 1968). The concept "reinforcer" is borrowed from this theory. Twenty-one reinforcer dimensions of occupations were defined and an inventory developed to analyze occupations in terms of these dimensions. The inventory is called the Minnesota Job Description Questionnaire (MJDQ). The dimensions are comparable to the need dimensions listed earlier with one addition. The 21 reinforcer dimensions and a statement defining each dimension appear in Table 5.

The listing in Table 5 of reinforcer dimensions does not presume to include all reinforcers which may be relevant in a given situation. However, it does represent a reasonably comprehensive list of dimensions which can be used to describe the reinforcers available in a work environment. In addition, the approach taken in the Theory of Work Adjustment and supportive research, using the MJDQ, demonstrates the utility of estimating reinforcer profiles for occupations.

Although the various approaches agree that the concept of reinforcers is important and that there are various types of reinforcers, there are some differences among the approaches in terms of measuring or estimating reinforcers. The Herzberg (1966) two-factor theory suggests that this be done through in depth

[4] Since the Cornell Studies according to Smith et al., (1969) are not supposed to represent a theoretical position, the preceding statement refers to the remaining four theories (i.e., Two-Factor, Equity, Expectancy, and Need-Fulfillment).

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Table 5. Reinforcer Dimension Scales with Illustrative Defining Statements of the Minnesota Job Description Questionnaire (MJDQ)[a]

Dimension Scales	Illustrative MJDQ Statements. Workers on this job . . .
1. Ability utilization	make use of their individual abilities.
2. Achievement	get a feeling of accomplishment.
3. Activity	are busy all the time.
4. Advancement	have opportunities for advancement.
5. Authority	tell other workers what to do.
6. Company policies and practices	have a company which administers its policies fairly.
7. Compensation	are paid well in comparison with other workers.
8. Co-workers	have co-workers who are easy to make friends with.
9. Creativity	try out their own ideas.
10 Independence	do their work alone.
11. Moral values	do work without feeling that is morally wrong.
12. Recognition	receive recognition for the work they do.
13. Responsibility	make decisions on their own.
14. Security	have steady employment.
15. Social service	have work where they do things for other people.
16. Social status	have the position of "somebody" in the community.
17. Supervision-human relations	have bosses who back up their men (with top management).
18. Supervision-technical	have bosses who train their men well.
19. Variety	have something different to do every day.
20. Working conditions	have good working conditions.
21. Autonomy	plan their work with little supervision.

[a]Borgen, Weiss, Tinsley, Dawis, and Lofquist, 1968, p. 12.

interviews, where individuals are asked to describe times when they were particularly satisfied or dissatisfied. When the protocols are coded for each person, a score is assigned for each factor indicating presence or absence of the factor. There is no indication of the degree of the reinforcer.

Expectancy theory includes the concept of instrumentality (Vroom, 1964) or its equivalent, performance-reward probability (Porter & Lawler, 1968a). Both these variables represent the perceived likelihood that a particular job or performance level will lead to a certain reinforcer. Thus, it represents an index similar to "subjective probability" that a particular reinforcer will be obtained. The approach recognizes degrees of likelihood, but does not deal with variations in the level of reinforcers.

The Theory of Work Adjustment obtains a reinforcer profile for an occupation which represents the degree to which a certain reinforcer is descriptive of the occupation. This value is some complex combination of level and likelihood, depending on the perception of the rater.

To some extent, the differences in these three approaches represent simply verbal quibbling. However, it seems clear that there are at least two approaches to the measurement of reinforcers which could be taken by the Air Force. One would involve attempting to separate the different facets of

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reinforcers, such as level and likelihood of occurrence, and measure the two separately. The second approach would put the burden on the rater to subjectively combine the separate facets and provide ratings on a complex scale, such as the relevance of the reinforcer to a particular career ladder, or the extent to which the reinforcer describes the career ladder.

Alternatives Available. According to Equity theory, an important influence on job satisfaction is one's perception of available alternatives. In the Equity formulation, the individual constantly compares his input/outcome ratio to the input/outcome ratio of a comparison person. The comparison person may be someone in the same organization or someone in a different organization. For an individual in a military environment, it seems reasonable to expect that an individual would weigh the reinforcers available in the military environment against those available in the civilian sector. This comparison process would likely have considerable impact on not only job satisfaction, but also on the individual's career decision. Presumably, if the individual perceived that the input/outcome ratio were more favorable in the civilian sector, this would represent strong influence against an Air Force career. The potential importance of this variable warrants its inclusion in the Air Force satisfaction research program.

One approach to measuring the alternatives available to an individual would be to ask that individual to rate the job he would expect to have if he were a civilian on the same reinforcer dimensions used to describe his Air Force career ladder. The scale used could be a level, likelihood, or a combination of the two. Such an approach would have the advantage of making comparisons between the perceived reinforcers provided by both military and civilian occupations. This, together with information on the needs of the individual, should be useful in predicting his career decision.

Geographical Variables. Although geographical variables are not emphasized by any current theory of work motivation, recent surveys in the Air Force suggest that such a set of variables are extremely important. Since it can be demonstrated that individuals vary in terms of the types of geographical locations preferred, it seems reasonable that such a set of variables would affect one's level of satisfaction or dissatisfaction. Therefore, a complete theory of work motivation should incorporate characteristics of geographic locations as well as physical and social characteristics of the work situation.

Table 6 represents a list of geographic-environmental variables of possible importance. This list is taken from an inventory booklet used in a recent Air Force study of assignment preferences of airmen (Tuttle & Brockhaus, 1973). Data on the variables in Table 6 could be determined objectively from various sources, or judgments could be solicited from individuals in terms of the position of their current location on each variable. It would be expected that this set of variables, together with the life history information, would combine to predict an individual's level of satisfaction with his assignment location.

Implications of Theories – Individual/Situational Variables

As mentioned previously, this category includes primarily those variables defined by expectancy theories. Included are valence, instrumentality, expectancy and force or effort. As implied by the label, it is assumed that these variables represent the interaction of both individual and situational variables. As a result, the values of these variables for an individual are expected to vary with changes in the situations.

In the initial stages of the Air Force research program, it seems that this set of variables should be assigned a rather low priority. This is due to the fact that use of such variables implies a level of analysis which is premature at the early stage of the program. For later detailed study of the specific relationships among individual and situational variables and satisfaction, this set of variables should prove helpful. However, much initial ground work needs to be done prior to such analyses.

Job Satisfaction. Each of the approaches discussed recognize the concept of job satisfaction. In the present regard, satisfaction refers to the extent to which the work situation satisfies the requirements of the individual. Considerable research has been conducted in an attempt to define the facets or dimensions of job satisfaction. As was the case with reinforcers, the most comprehensive approach to defining and measuring the dimensions of satisfaction has been accomplished by the researchers employing the Theory of Work Adjustment (Dawis et al., 1968). One of the outputs of this research has been the development of a measure of job satisfaction called the Minnesota Satisfaction Questionnaire (MSQ). The MSQ measures 20

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Table 6. **Geographical-Environmental Variables for Studying Airmen Assignment Preferences**

1. Size of base military population.
2. Population size of the surrounding community.
3. Availability of on-base housing.
4. Availability of off-base housing.
5. Cost of off-base housing in relation to the national average.
6. Cost of living of the region in relation to the national average.
7. Distance to a city with a population of at least 200,000.
8. Availability of a 2-year college within one hour's driving time.
9. Availability of a 4-year college within one hour's driving time.
10. Availability of a graduate or professional school within one hour's driving time.
11. Distance to the mountains.
12. Distance to desert.
13. Distance to a bay or ocean.
14. Distance to a lake or river.
15. Average relative humidity.
16. Average summer temperature level.
17. Average winter temperature level.
18. Amount of seasonal temperature change.
19. Average amount of rainfall.
20. Average number of inches of snow per year.
21. Average percentage of sunshine.
22. Distance from your home town.
23. Distance from your spouse's home town (if married).

facets of job satisfaction and also yields a score on overall satisfaction. A list of the 20 scales (facets) measured by the MSQ appears in Table 7, along with a representative item defining each facet.

Recognizing that job satisfaction is multi-faceted, and that there is no well developed inventory to measure various facets of job satisfaction for the military, development of such an inventory should receive first priority in the Air Force satisfaction research program. The above list of dimensions can serve as a convenient starting point in this effort. One major goal of this inventory development phase should be the determination of the relevant dimensions of satisfaction among Air Force personnel. Once a set of dimensions are established, they could be used in much the same way as the dimensions defined by the Theory of Work Adjustment researchers have been used.

Satisfactoriness. The concept of satisfactoriness as used in the Theory of Work Adjustment (Dawis et al., 1968) refers to the extent to which an individual satisfies the requirements of the work environment. In

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Table 7. **Scales and Illustrative Items from the Minnesota Satisfaction Questionnaire (MSQ)[a]**

MSQ Scales	Illustrative Items
1. Ability utilization	The chance to do something that makes use of my abilities.
2. Achievement	The feeling of accomplishment I get from the job.
3. Activity	Being able to keep busy all the time.
4. Advancement	The chance for advancement on this job.
5. Authority	The chance to tell other people what to do.
6. Company policies and practices	The way company policies are put into practice.
7. Compensation	My pay and the amount of work I do.
8. Co-workers	The way my co-workers get along with each other.
9. Creativity	The chance to try my own methods of doing the job.
10. Independence	The chance to work alone on the job.
11. Moral values	Being able to do things that don't go against my conscience.
12. Recognition	The praise I get from doing a good job.
13. Responsibility	The freedom to use my own judgment.
14. Security	The way my job provides for steady employment.
15. Social service	The chance to do things for other people.
16. Social status	The chance to be "somebody" in the community.
17. Supervision-human relations	The way my boss handles his men.
18. Supervision-technical	The competence of my supervisor in making decisions.
19. Variety	The chance to do different things from time to time.
20. Working conditions	The working conditions.

[a]Weiss, Dawis, Lofquist, and England, 1966, XXI.

this regard, Airman Performance Reports are indicators of satisfactoriness. Research is also underway to develop more specific measures of individual performance at the task level.[5] Either of these could serve as performance criteria in the job satisfaction research program.

The concept of satisfactoriness is important to a job satisfaction research program for several reasons. First of all, there is some suggestion from Porter and Lawler (1968a) that performance (i.e., satisfactoriness) is related to satisfaction. As noted previously, Lawler and Porter (1967b) and Lawler (1968a) argue that performance is a producer of satisfaction.

Furthermore, an important measure of the Air Force personnel system is the extent to which the most satisfied people are also ranked highest in satisfactoriness. To the extent that those high in satisfaction are also low in satisfactoriness is an indication that something is wrong with the way reinforcers are dispensed. Another way of stating this is that the discrepancy between levels of satisfaction and satisfactoriness is an indicator of the extent to which reinforcers are tied to performance.

[5]Personal conversation with Mr William B. Lecznar, Occupational Research Division, AFHRL, 1 Mar 73. The objective of Air Force Work Unit 77340601 is concerned with job performance measures at the task level. A study is in progress to assess how well tasks are performed in three enlisted AFSCs.

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Similarly, the Air Force in the zero draft environment desires to keep those who perform at acceptable levels. If it is assumed that satisfaction is linked to retention, then it is desirable to have those who are satisfied and inclined to remain in the Air Force also be those who perform at adequate levels. In order to evaluate this it is necessary to have measures of both satisfaction and satisfactoriness.

Development of measures of satisfactoriness appear outside the scope of the Air Force job satisfaction research program. However, use of scores on measures developed by others, will be analyzed along with the data collected, and comprises a part of the satisfaction research effort. One approach, currently underway, involves construction of a large data base which pulls together, from separate data sources, information on all variables presumed relevant to job satisfaction of airmen. Since one set of variables in this data base will be Airman Performance Report scores along with certain job satisfaction measures (i.e., job interest and expressed utilization of talent and training), it will provide some information needed to answer questions such as the above. In general terms, such research would involve Time 1 and Time 2 measures of both job satisfaction and performance for several airmen career ladders, and employ in a cross-lagged panel correlation design similar to that used by Lawler (1968a).

Statement of a General Model of Satisfaction

The plan followed throughout this section has been to discuss the implications of the various motivation theories for the Air Force job satisfaction research program. The primary emphasis to this point has been on the identification of sets of variables which should be considered in any comprehensive approach to job satisfaction.

Implicit in the preceding discussion has been a very general model of satisfaction. This model has two types of inputs, a throughput, an output, and feedback. Figure 7 is a diagram of the model which may serve as a guide for the preceding and subsequent discussions.

Inputs. The model depicts two types of inputs, individual and situational. Individual inputs include those variables discussed in the earlier section on individual variables. These include Abilities, Interests, Needs, and Life History variables. Additionally these variables are assumed to affect another set of variables which are called Individual Expectations.

Situational inputs are the second type of inputs and include most of the variables discussed earlier as situational variables. These include Ability Requirements, Interest Requirements, Potential Reinforcers, and Geographic Characteristics. The situational inputs are also related to a set of variables called organizational expectations.

Throughput. The category labeled throughput includes some variables discussed earlier as situational variables, notably instrumentality and "actual" outcomes. Essentially, this set of variables includes the core of variables drawn from expectancy theory formulated by Vroom (1964) and Porter and Lawler (1968a). Expectancy theorists are much more specific about the nature of the relationships among these variables. The present model does not assume anything about this set of variables except that they represent the interaction between the individual inputs and situational inputs. How these two sets of inputs combine in the throughput section of the model remains to be specified.

Decision Blocks. The model incorporates two decision blocks which evaluate the results of the individual-situational interaction in terms of two sets of expectations. One block is concerned with the extent to which the expectations of the individual are met and the other with the extent to which the expectations of the organization are met.

Outputs. The model assumes two types of output or criteria. These are satisfaction and satisfactoriness. Satisfaction is considered to be the extent to which the expectations of the individual regarding the work situation are met. Satisfactoriness, on the other hand, refers to the extent to which the expectations of the organization are met.

Further, following Porter and Lawler (1968a), it is assumed that his level of satisfactoriness is perceived by the individual and has an effect on his satisfaction. This may be the result of his supervisor actually telling the individual how he is being evaluated, or it may be simply the individual's own judgment of how well he is performing. In any event, the model assumes a relationship between satisfactoriness and satisfaction.

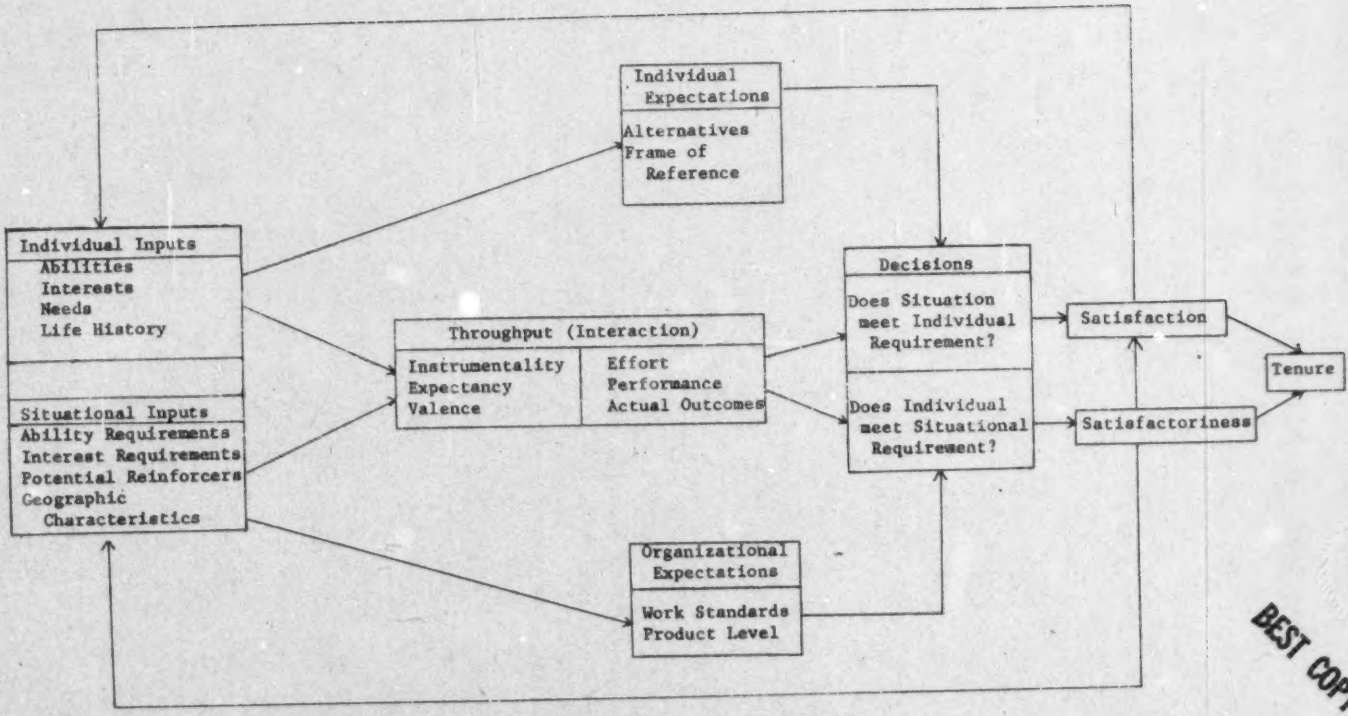

Fig. 7. **General Model of Satisfaction.**

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Tenure. Following Proposition VIII of the Theory of Work Adjustment (Dawis et al., 1968), tenure is assumed to be a joint function of satisfaction and satisfactoriness. The probability of an individual voluntarily leaving the organization is related to his level of satisfaction. On the other hand, the probability of an individual being asked to leave the organization is assumed to be related to his satisfactoriness. In the Air Force, this latter condition will likely become increasingly applicable due to the effects of personnel management programs such as TOPLINE and TOPCAP (Department of Air Force, 1971).

Purpose of the Model. This model attempts to integrate the most relevant variables gleaned from the general theories, along with some variables which are not included in any theory, into a general conceptual scheme. Although the model depicts interactions among various variables, it does not attempt to specify the nature of these interactions. In this sense, the model is static and cannot explain how two sets of variables combine to produce a third set of variables. The model only assumes that, given measures of the inputs, it is possible to combine them in such a way to account for a substantial amount of variance in the outputs. In other words, the throughput is treated as a "black box" and the mechanisms operating inside the box are not explained. It is recognized that expectancy theory formulations do attempt to explain the dynamics of the black box as portrayed in this model.

The purpose of the general model depicted is to provide a loose framework for systematically considering those variables presumed relevant to job satisfaction. In the early stages of the Air Force satisfaction research program, the primary concern is that relevant variables be considered. Later stages of the research will concentrate on the nature of the relationships among the variables. In other words, the present emphasis is on the "input and output boxes" in the diagram. Later stages of research will concentrate on the "arrows" and the throughput. As more knowledge is gained from later phases of the research, the model can be revised or elaborated. One should note that the model is only a means to an end. This model is only intended to serve as a conceptual framework to facilitate the search for ways of increasing the satisfaction of Air Force personnel. The model is only useful insofar as it serves to guide this effort.

IV. CONCLUSIONS AND RECOMMENDATIONS

This report provides a review of leading theories of work motivation, particularly as they relate to job satisfaction. The five major approaches considered were (*a*) Two-factor Theory, (*b*) Equity Theory, (*c*) Instrumentality-Expectancy Theory, (*d*) Cornell Studies of Job Satisfactions, and (*e*) Need-Fulfillment Theory. For each of these theoretical positions, the basic concepts are described, major modifications are reviewed, and relative strengths and weaknesses assessed.

A second purpose of this report was to derive implications from the various theoretical approaches for the Air Force job satisfaction research program, which as presently viewed has the following long range objectives: (*a*) determine the dimension of job satisfaction for Air Force personnel; (*b*) determine the relation of these variables to career decision; and (*c*) evaluate the impact of job changes on career attitudes and decisions. The major implications drawn pertain to the sets of variables, methodology, approaches, and suggested areas of research that should be considered and emphasized in the comprehensive systematic job satisfaction research program as outlined above, and how to proceed in the accomplishment of these objectives. A comprehensive bibliography of job satisfaction research from the civilian sector was also prepared.

Conclusions. From the review and implications, certain conclusions can be drawn regarding the current state-of-the-art in job satisfaction research. These conclusions are listed subsequently.

The military services have made a fair amount of use of job satisfaction/work motivation theories in job satisfaction/career motivation/retention research. A review of over 284 military studies or reports yielded 37 references involving different theories in varying degrees. The earlier, and predominant number of studies were concerned with two-factor theory, but more recent studies involved Equity and Expectancy theories and the Theory of Work Adjustment.

With regard to a theoretical orientation for Air Force job satisfaction research, an eclectic position appears desirable. There is no single theory or approach that is sufficiently developed to provide an adequate conceptual basis for a systematic Air Force research program. However, certain implications

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suggest that some aspects of Expectancy theory and the Theory of Work Adjustment may be particularly useful and successfully applied in Air Force job satisfaction research.

Due to the complexity of job satisfaction, a general model of satisfaction was devised which may serve as guidance for the long-range Air Force job satisfaction research program. The model generally was developed from certain concepts in Expectancy theory and the Theory of Work Adjustment, plus additional concepts not covered in the five theories considered. The purpose of the model is to provide a flexible conceptual framework for systematically considering variables relevant to satisfaction. The model is designed such that it may be revised as more knowledge is obtained.

A common concern among the various theories is the question, "What is job satisfaction?", and considerable research has been conducted in answer of this question. An important first step of the long-range research program outlined should be the definition of job satisfaction in the Air Force. This approach should attempt to determine the relevant aspects or dimensions of job satisfaction from the point of view of Air Force personnel. An effort is currently underway to identify major dimensions of job satisfaction in the Air Force with a survey titled "Occupational Attitude Inventory."

Related to the preceding question regarding the dimensions of job satisfaction is the question concerning variables that produce or affect satisfaction (i.e., determine the unique contributions of specific variables to job satisfaction). A categorization of sets of variables that should be considered is provided in an effort to help conceptualize this problem. These categories are individual, situational, individual – situational, and output variables. As considered in this report, individual variables are assumed stable measurement characteristics of the individual. Situational variables are assumed stable measurable characteristics of the work situation, independent of the incumbent. Individual – situational variables involve individual interaction with situations. Output variables are those which are the result of the individual – situational interaction.

The Air Force approach should make use of both individual and situational variables in attempting to explain job satisfaction, and a study of these sets of variables should precede efforts to study individual – situational variables due to the complexity of the relationship of this latter category. For situational variables, the Air Force is currently engaged in research to investigate aptitude level requirements in various career fields, interest requirements of jobs, and geographical-environmental variables presumed to affect assignment location preferences.

The definition and measurement of job satisfaction has presented a long standing problem despite the fact that four decades of research in this area has yielded a variety of techniques and methods. There are reasons to suspect that the particular measurement technique utilized may influence the results obtained. For example, research leading to the development of the two-factor theory used in depth – structured interviews for data collection. Others, such as Dawis et al., (1968) and Smith et al., (1969), used various types of questionnaires or inventories. This situation suggests certain cautions may be advisable with regard to method and, for Air Force research, the use of varied techniques such as interviews, surveys, or some other combination of methods seems desirable. The use of more than one measurement approach may lead to conclusions in which greater confidence can be placed that obtained results are not artifactual.

With regard to the measurement of job satisfaction, a potentially useful concept is that of the individual's frame of reference, provided the concept can be operationally defined. One approach to making the concept operational is offered by a technique called the self-anchoring scale which allows the respondent to define his anchor points on a subjective scale. Such an approach could be used to measure overall satisfaction or separate dimensions of satisfaction. This technique is currently being investigated. Additionally, as an adjunct to the problem of job satisfaction measurement, a comparison of the predictability of various job satisfaction criteria warrants further consideration in Air Force research.

Several aspects of the job satisfaction-performance relationship controversy described in this report suggests further inquiry into this problem is justified. One version of Expectancy theory (Porter & Lawler, 1968a) considered satisfaction as a function of performance and rewards (i.e., job satisfaction is an output). The Cornell Studies considered both satisfaction and performance as outputs attributable to the interaction of other variables (i.e., both predictable from other variables), and expressed the view that performance may vary depending on aspects of the job. The general model of satisfaction developed and presented in the current effort described two outputs; satisfaction (or the extent to which expectations of the individual are met) and satisfactoriness (or the extent to which expectations of the organization are met). Tenure was

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assumed to be a joint function of these two outputs. Thus the present model does not ascribe fully to either the older view that performance is the consequence of satisfaction, or the more recent view that satisfaction is a function of performance. Rather, a more flexible framework or approach is attempted which permits the systematic inquiry of possible relationships between job satisfaction, performance, tenure, and other relevant variables.

In addition to a review of the major theories and their implications for Air Force job satisfaction research, a third purpose of this report was to compile a comprehensive bibliography of studies pertaining to job satisfaction, work motivation, and tenure/career decisions. The bibliography was prepared to assist the Air Force job satisfaction research program and also to be used by other researchers in satisfaction and related areas. The bibliography, consisting of approximately 300 citations in addition to those given in the reference list, covers about four decades of job satisfaction from civilian publication sources. For reader convenience a synopsis of certain findings considered out of the scope of a discussion of theories was also prepared.

Recommendations for Air Force Job Satisfaction Research Program. Based on the preceding discussion of implications and conclusions, certain suggestions or steps to be taken in the Air Force research program appear feasible. These recommendations are as follows:

1. Since the particular job satisfaction measurement technique employed may affect results obtained, use of varied methods such as surveys, interviews, or a combination of techniques appears desirable.

2. Develop a job satisfaction inventory covering the range of satisfactions assumed to be relevant to individuals in the Air Force. Use the items in this inventory as a basis for inferring dimensions of satisfaction. Identified dimensions could be used to compliment job enrichment research efforts.

3. Determine the relationships between the output variables in the general model of satisfaction developed, and tenure. More explicitly, the relationship between satisfaction dimensions and tenure should be investigated for those individuals who stay or separate voluntarily from the Air Force. Implicit in this recommendation is the recognition that, from an operational viewpoint, tenure is the ultimate criterion of the success of a job satisfaction program in an all-volunteer force.

4. Estimate, using occupational analysis procedures, the interest requirements and potential reinforcers in career ladders where turnover is a problem. Additionally, occupational analysis procedures may be useful in determining how to obtain better matches of individuals to jobs in order to improve job satisfaction.

5. Obtain measures of satisfaction (individual and situational variables) at one point in time from individuals in selected career ladders along with job and task information from occupational analysis inventories. After some period of time has elapsed, repeat the administration of such measures. Analyses of the data collected at two different time periods should answer the following questions: (*a*) What proportion of the variance in job satisfaction criteria at one point in time can be explained by the individual and situational variables? (*b*) What are the effects of changes in situational variables (including both task and job variables) over time on expressed job satisfaction and tenure?

6. Related to and stemming from the approach outlined in the preceding recommendations, the Air Force research program should consider ways of accomplishing job enrichment for Air Force personnel. Although considerable time will be required to systematically investigate the effect of job changes on satisfaction, the Air Force, as compared to industry, is in a unique situation to undertake such research. Due to the large number of assignment actions taken each year, it would be possible to observe Time 1/Time 2 job changes without the necessity of experimentally manipulating variables. The goal of such research would be to identify specific changes in job structures which are reasonable and amenable to alteration within the existing operational Air Force personnel system. After sufficient insight regarding what constitutes job enrichment in different occupational fields is achieved, some form of job enlargement/job enrichment guidelines for use or implementation by supervisors or commanders may be developed. However, the development of any overall guidelines should be approached cautiously due to the possibility that job enrichment may vary widely for different occupational ladders.

7. In addition to job enlargement/job enrichment suggestions, there are other modifications to Air Force personnel practices which seem feasible in order to increase job satisfaction and improve tenure. These should include recommendations concerning better initial matching of individuals with career ladders

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and jobs within career ladders, as well as methods for increasing the correspondence between job situations and individual characteristics for individuals after assignment to a career ladder. The recommendations made in item 4 would provide criteria in terms of which individuals could be matched with jobs.

As noted, the development of measures of satisfactoriness or the extent to which the individual satisfies requirements of the work environment seems outside the scope of the Air Force job satisfaction research program. However, the use of standard performance measures such as Airman Proficiency Reports to investigate the satisfaction – performance relationship appears to be an initial worthwhile endeavor. Additionally, if major methodological breakthroughs occur in the development of performance criteria (e.g., measurement of individual performance at the task level), the satisfaction – performance controversy will warrant reexamination.

As a general recommendation, while the military services cannot be expected to devote as much effort or resources to the development of theories as the academic setting due to the applied nature of their research, some attempt should nevertheless be made to incorporate a certain amount of theoretical framework in their job satisfaction/tenure research. Such an effort seems desirable in order for research to be more systematic and increase the probability of payoffs (i.e., develop operational implementation recommendations based on substantive evidence). In addition, there is the typically recognized guidance function served by theories. The Air Force research program will benefit from staying informed of current developments with regard to job satisfaction theories. At the current stage of theory development, a multi-theoretical position appears desirable.

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APPENDIX A: CONSOLIDATED BIBLIOGRAPHY OF JOB SATISFACTION, WORK MOTIVATION, CAREER DECISIONS, AND RELATED RESEARCH FROM CIVILIAN SOURCES (EXCLUDING REFERENCES)[6]

Preface

The concern of industrial psychology with monotony, boredom, or alienation in the "working place" is not new, despite the frequency with which such topics are mentioned in popular news media. The "father of applied psychology," Hugo Munsterberg (1913), made one of the first scientific inquiries regarding work monotony over a half-century ago at the time when the controversy over use of introspection in experimental psychology was active. Thus there is reason to believe that concern with job satisfaction or work motivation probably had its beginning at the time industrial psychology was established.

The purpose of this section of the report is to offer some guideposts to those wandering in the wilderness of job satisfaction research. As previously noted, one of the major purposes of the present report was the development of an extensive bibliography regarding work motivation, job satisfaction, career decision, and related research. Such a bibliography appeared necessary in developing a long-range Air Force job satisfaction research program. Such an undertaking was considered a logical consequence of a review of the major theories of job satisfaction. This section of the report describes how the bibliography was developed, gives an overview of its contents, and summarizes certain findings regarding the literature reviews which may be useful to researchers or managers concerned with questions in these areas.

With over four decades of research to consider, the decision was made to limit the scope of the bibliography to studies primarily from the civilian research sector. However, implicit in this omission of military studies except for certain references considered necessary to reflect the use of theories in military job satisfaction research, was the recognition that a separate review of military satisfaction studies would be a desirable undertaking to enhance the Air Force research program. This civilian-military classification essentially was based on the source of publication (i.e., civilian journal or text *versus* military technical report) or the use of military or civilian samples of subjects, and whether research was sponsored by or conducted under military service auspices. Such a grouping is not entirely mutually exclusive however, so the bibliography contains some citations which may be classified in either category.

The strategy employed to develop a comprehensive job satisfaction and related research bibliography involved both computerized abstract searches as well as more traditional procedures. An American Psychological Association (APA) Psychological Abstracts Search and Retrieval Service (PASAR) search[7] was made, which after screening yielded a large number of relevant reports. Two supplemental computerized Defense Documentation Center (DDC) searches[8] identified another large group of studies. Various job satisfaction/work motivation texts, articles, and journals with literature reviews or extensive bibliographies were also examined. In brief, the amount of effort expended offered reasonable assurance that a very large percentage of the relevant studies in the civilian sector were recognized.

Synopsis

The preceding effort resulted in the identification of approximately 400 studies, reports or texts primarily from the civilian sector and covering about 38 years (1935 through 1973). This number included 139 citations listed in the Reference section. In addition, 284 military references covering approximately 20 years were identified, but as previously noted, most of these references were excluded from the report.

The literature reviews of job satisfaction and related research which appeared over the past four decades are particularly useful in providing an overall perspective of the amount and nature of effort in

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[6] For consistency, all citations in this Appendix are listed in the preceding Reference section.

[7] APA-PASAR Search + SR-431, April 1972, entitled Job Satisfaction. Fourteen index terms and six key words were used, resulting in 556 "hits."

[8] Defense Documentation Center, Alexandria, Va. Report Bibliographies for Search No. 082500 (Job – Work Satisfaction in the Military Services) and DDC-TAS-68-37 (Retention, Work Motivation, and Retirement of Military Personnel).

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these areas. A summary covering some of the more prominent reviews is presented herewith in order to offer an overview of the extent, trends, recurrent problems, and topics of interest in job satisfaction research.

Historically, probably Hoppock's (1935) text marks the first major attempt at summarizing job satisfaction research. About 20 years elapsed before the next major review by Brayfield and Crockett (1955) appeared, followed closely by the Herzberg, Mausner, Peterson, and Capwell (1957) review. From this point on, the amount of research tended to increase, with a concomitant increase in the frequency of literature reviews. In the mid-1960's, an interesting review appeared (Fournet, DiStefano, & Pryer, 1966) which outlined some of the issues and problems encountered in job satisfaction research. Since the earlier reviews as well as later reviews considered some of the same problems, a short listing of some issues, with examples, is provided below for illustrative purposes:

1. Methodological approaches to assess satisfaction (e.g., questionnaires, interviews, sentence completion techniques).

2. Factors associated with job satisfaction (e.g., individual variables such as age, education, sex, occupational level, and job characteristic variables such as organization, supervisor, social environment, security, and pay).

3. Consequences of job satisfaction (e.g., relationship of job satisfaction and performance, absenteeism, and turnover).

4. Theory (e.g., Two-Factor, Need, and Expectancy).

A report by Cummings and ElSalmi (1968) perhaps reflects a certain shifting of interest or change in emphasis towards "Managerial Motivation" or organizational behavior, although it does include the typically broader range of topics in job satisfaction research. However, a review by Schuh (1967) concerning tenure, which covered a wide range of sources, represented a trend towards a more specialized type of literature review. Another such specialized review regarding turnover and absenteeism of more recent vintage was provided by Porter and Steers (1972). These authors state that about four more specific turnover and absenteeism literature reviews have been published, with three out of date (Brayfield & Crockett, 1955; Herzberg et al., 1957; and Vroom, 1964) and the one by Schuh (1967) incorporating more recent research.

One of the more recent comprehensive literature reviews, covering a broad range of topics, is the one by Ronan (1970). This review, when compared to the one by Fournet et al., (1966), reveals that many recurrent issues and problems are still unresolved (e.g., dimensions or criteria of job satisfaction, methods of measurement, relation of satisfaction, and performance). However, there are other indications that perhaps job satisfaction research is progressing in an upward spiral direction. For example, there was more attention given to theoretical studies and the belief that satisfaction is the result of the complex interaction of many variables. In an optimistic view, Ronan (1970) contends that certain invariant dimensions of job satisfaction have been isolated and the bases of job satisfaction differ for various occupational groups. Such examples may be indicative of substantial progress in the area.

One systematic set of literature reviews, providing an annual or bi-annual account of job satisfaction and related research that deserves special attention, is the series offered in two periodicals, *Occupations and the Personnel and Guidance Journal.* The first of these reviews (Hoppock & Spiegler, 1938) followed shortly after the appearance of Hoppock's (1935) classic text, and have been continued to the present time with considerable consistency of format and content. A quotation from a recent review is provided in order to summarize the scope of this series:

> *This review of job satisfaction research is the 24th in a series. It covers earlier studies not previously reviewed in this series as well as 103 reports published in 1966-67 relating job satisfaction to some 53 variables.*
>
> *The format – overview, variables investigated, current emphases – has become standard in this series. Earlier summaries will be found in* Job Satisfaction *by Robert Hoppock (Harper & Bros., 1935), in* Occupations *(April 1938, October 1940, February 1943, April 1945, April 1948, December 1948, December 1949, October 1950, May 1951, May 1952), and in the* Personnel and Guidance Journal *(September 1953, September 1954, May 1955, May 1956, September 1957, September 1958, May 1959, September 1960, December 1961, November 1962, October 1963, December 1964, December 1966).* [Pallone, Rickard, Hurley, (1970), p. 469]

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To detect certain trends in job satisfaction research, the number of references cited and variety of topics considered in this series of reviews from 1938-1967 were examined. While the number of studies appearing each year over this period was irregular, there was a general increase until the mid-1960's with sharp increase thereafter. Additionally, there was a corresponding increase in the number of topics considered. If the ratio of number of topics studied to the number of studies reviewed can be assumed to represent complexity of the studies conducted, there was also an indication of a widening scope of interest in job satisfaction research.

The current bibliography primarily concerns research from civilian sources. However, assuming a majority of the anticipated users of this report will be associated with the military services, a brief summation of some literature reviews performed by military service researchers seemed desirable. As shown in Table 1 (Section III – Implications) a number of military sponsored literature review technical reports concerning job satisfaction, work motivation, and retention were identified. These reports contained references to both civilian and military studies, but generally consisted of a majority of military citations. Additionally, there seems to be more concern with career intent or retention criteria in the military studies than in the civilian studies. Another notable aspect of the military studies was the large number of questionnaires and surveys which have been conducted.

As a final comment, a report of this nature would be incomplete without some mention of the amount of attention being shown in the popular news media regarding such topics as work monotony, boredom, absenteeism, and alienation. While the bibliography contains few popular media source references (i.e., newspapers, magazines, TV, etc.) a host of articles concerning such topics as job enrichment, "blue-collar blues," and worker alienation have appeared recently. In addition, various professional organizations and management consultant firms seem to be increasing their offerings of work motivation – job enrichment meetings and workshops. This trend appears to corroborate the increase in job satisfaction research noted from the *Personnel and Guidance Journal* series of reports. Still further, the U. S. Senate (1973) has proposed bills to provide research for solutions to problems of alienation among American workers. If the current amount of activity and public attention are taken as indications, the Zeitgeist smiles with favor on job satisfaction research.

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